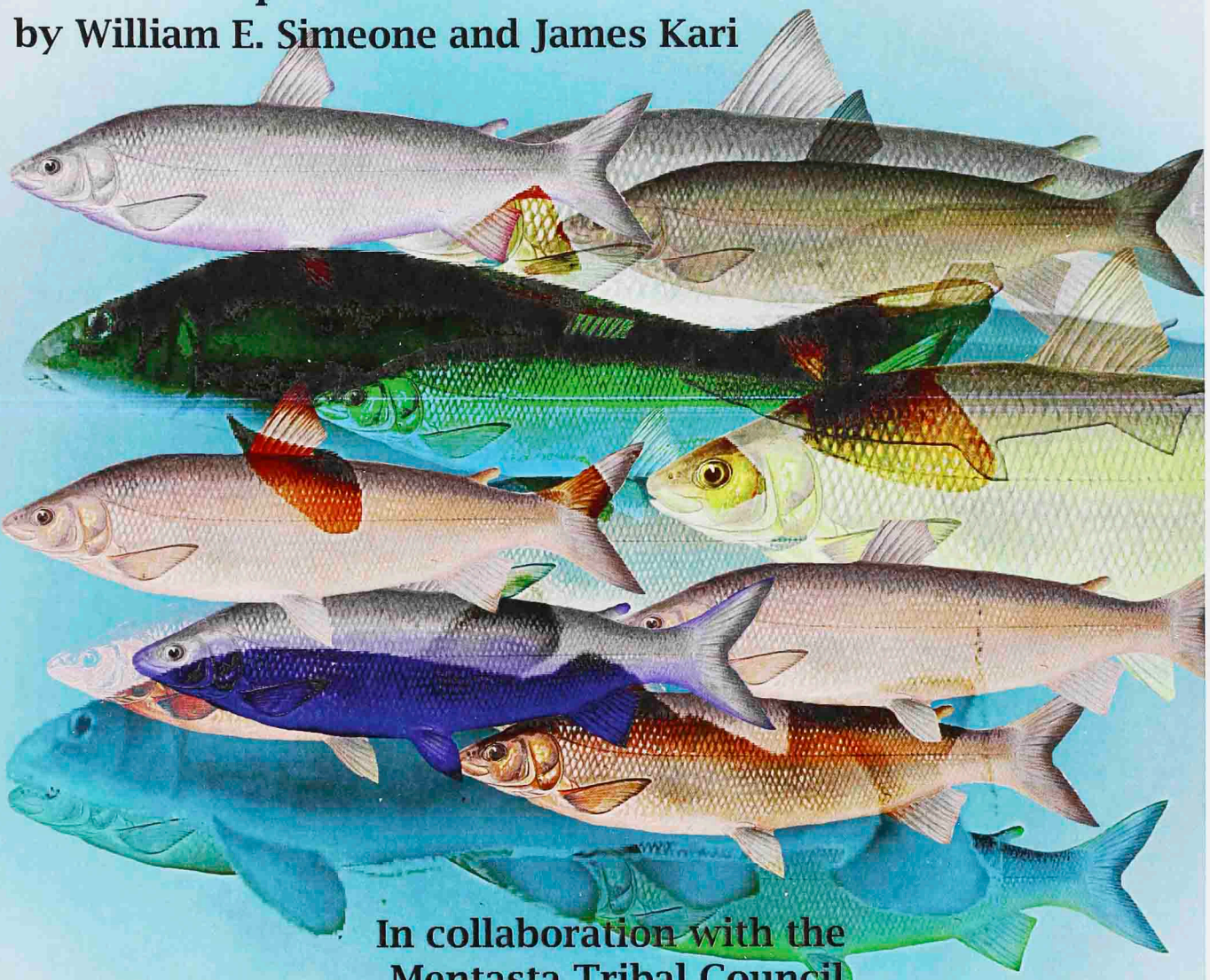
The Harvest and Use of Non-Salmon Fish Species in the Copper River Basin, Alaska

Technical Paper 292

by William E. Simeone and James Kari



In collaboration with the
Mentasta Tribal Council
Cheesh'Na Tribal Council
Copper River Native Association and
the Chitina Tribal Council

Alaska Department of Fish & Game
Division of Subsistence
Technical Paper Series

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ABSTRACT

This report documents Ahtna traditional knowledge of non-salmon species fish and provides quantitative data on the current harvest of non-salmon species by residents of the Copper River Basin. Up until the middle of the 20th century non-salmon fish species played an important role in the traditional economy of the Copper Basin. The Ahtna elders interviewed for this project have considerable knowledge about non-salmon species and their comments reveal a keen understanding of ecosystem dynamics recognizing the connection between annual fish migrations, seasonal water fluctuations and hydrology. This information adds insight to the general scientific knowledge of non-salmon species the Copper Basin.

The harvest survey conducted in connection with this project documented the continued use of non-salmon fish by Basin residents. Species taken in greatest quantities, in terms of pounds harvested, were rainbow trout, grayling, whitefish, burbot, and Dolly Varden. Communities reporting the largest harvest of non-salmon species, over 1,000 pounds, were Copper Center/Silver Springs, Slana, Gakona, Tazlina/Copperville, Glennallen, Lake Louise, and Kenny Lake. The most frequent gear types used were rod and reel and jigging through the ice. Communities generally harvested non-salmon species that were locally available.

Key Wording Referencing: Copper River Basin, non-salmon resident species: whitefish, burbot, trout, steelhead, grayling, harvest survey, Ahtna traditional knowledge of non-salmon species.

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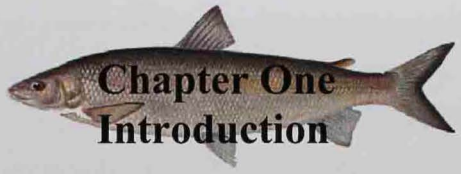
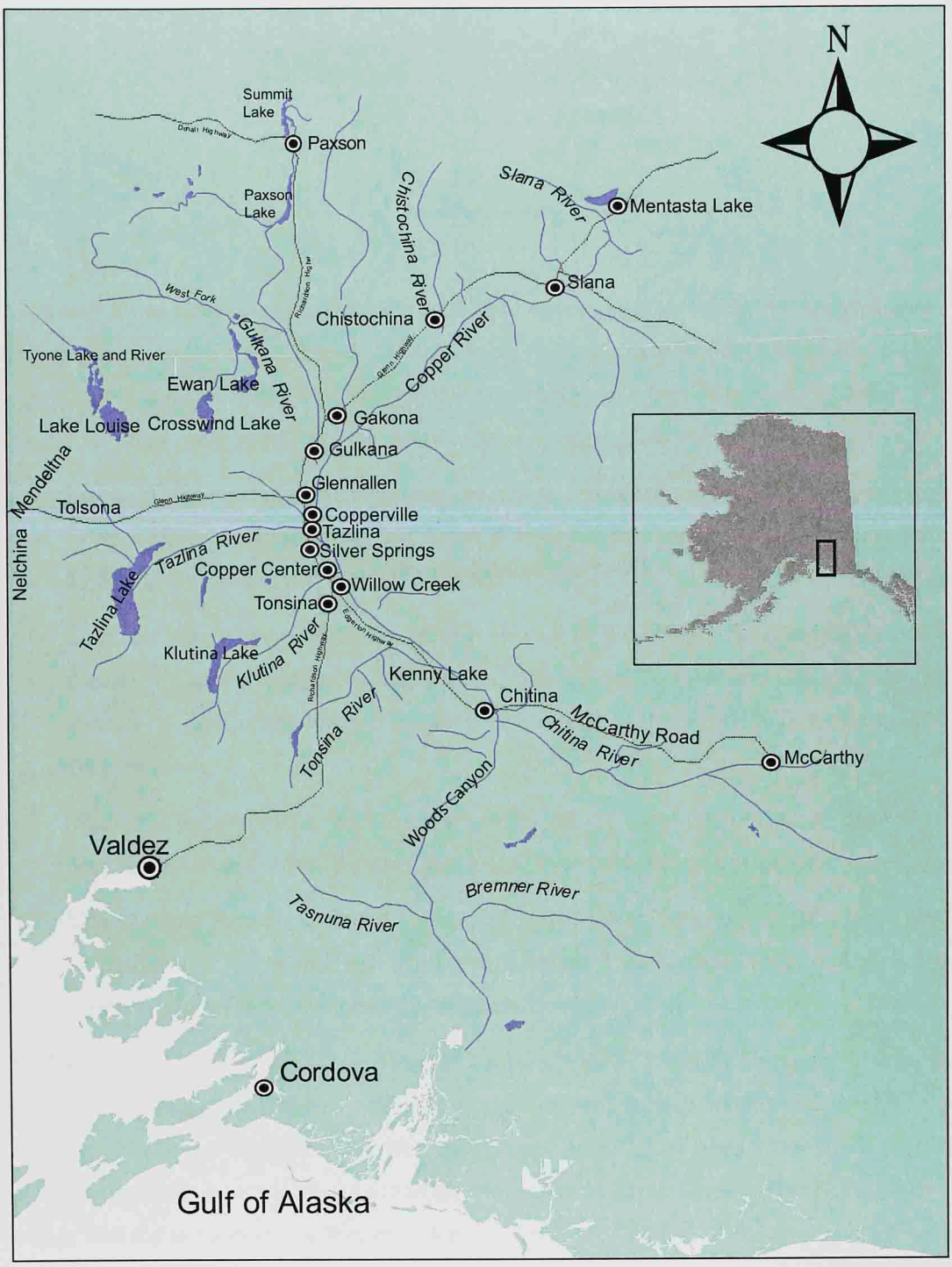


This report presents the findings of a study on the harvest and use of non-salmon fish species in the Copper River Basin of east central Alaska. The findings include traditional knowledge of non-salmon species collected in interviews with Ahtna elders that complements our earlier work on the Ahtna salmon fishery (Simeone and Kari 2002). Also included here are quantitative harvest data gathered through a household survey that updates information collected by the Division of Subsistence in the 1980s (Stratton and Georgette 1984; McMillan and Cuccarese 1988). The report is organized into seven chapters, including an introduction and conclusion. Chapter two introduces the Ahtna, who were the earliest residents of the Copper Basin, while chapters three, four, and five cover Ahtna traditional knowledge of non-salmon species, harvesting and processing techniques, and oral traditions about non-salmon fish. Current ethnographic literature provides little detail on the Ahtna's harvest and use of non-salmon species so this report helps to fill that void. Chapter six is a summary of results from a household survey on the current harvest and use of non-salmon species.

Research Objectives

The study had four primary objectives: 1) document Ahtna traditional knowledge of non-salmon species; 2) document current subsistence harvests and use of non-salmon resident species by residents of the Copper River Basin; 3) produce mapped data illustrating historic and current harvest locations, and 4) produce a final report that presents the findings of the research. Objectives for research on Ahtna knowledge of non-salmon species included documenting species harvested, life history, changes in abundance, traditional conservation measures, and mapping local knowledge of resident species habitat. Additional objectives included documenting patterns of seasonal movement in regards to the harvest of resident species, the extent of the harvest and relative dependence on non-salmon species, traditional harvest technology, and myths and stories related to non-salmon species. In a previous report (Simeone

Figure 1. Copper River Drainage



Chapter Two
Ahtna Traditional Knowledge of non-Salmon Species

The Ahtna

Traditional Ahtna territory covered an area of 30,000 square miles including the entire Copper River drainage and the upper ends of the Matanuska, Talkeetna, and Susitna river drainages (Figure 2). Within that area are four groups corresponding to the four dialects of the Ahtna language and four geographical subregions (de Laguna and McClellan 1981: 641-642).

1. Lower Ahtna territory encompassed the entire Chitina River drainage and the lower Copper River from below Wood Canyon to above the mouth of the Tonsina River, including the modern community of Chitina.
2. Central Ahtna territory included the lake district of the Copper River lowlands and the modern villages of Copper Center, Tazlina, Glennallen, Gulkana, and Gakona, which are located on the Copper River from above the mouth of the Tonsina River to above the Gakona River.
3. Western Ahtna territory included the drainages of the upper Nenana, Susitna and Mantanuska rivers. Most Western Ahtna now live in the village of Cantwell.
4. Upper Ahtna territory included the upper Copper River, from below the mouth of the Chistochina River to the Tok River drainage and Tanada and Copper Lakes and the modern villages of Chistochina and Mentasta.

The Ahtna elders interviewed for this project represent this diversity of language. Robert and Mae Marshall, Henry and Etta Bell, and John Goodlataw were born on the lower Copper River at Chitina. Fred Ewan, Frank Stickwan, Ben Neeley, and Andy Tyone were all born and raised in the Crosswind Lake area and have knowledge about Central Ahtna territory while Jake Tansy is familiar with the territory of the Western Ahtna. Katie John, Bell Joe, and Gene Henry represent the Upper Ahtna region.

Traditionally the most commonly harvested non-salmon species were humpback whitefish and Arctic grayling, followed by round whitefish, steelhead, Dolly Varden, lake trout, longnose sucker, burbot, and rainbow trout. This last species was almost thought of as a "pet," because people enjoyed watching it, and was seldom eaten (Bell Joe Ahtna Tape 121). Table 1 provides the common, Linnaean, and Ahtna names for non-salmon fish found in the Copper Basin. Shown in boldface type in Table 1 is the generic term ***tsabaey*** used to designate 'fish with white flesh, or fish other than salmon' (locally "trout"). ***Tsabaey*** is also the term used for the class *Pisces*.

The Ahtna have terms for 19 species of fish in the overall language area and have recognized and named all 14 species of fish that are identified in the Alaska Department of Fish and Game species inventory and found in the Copper River Basin. One fish, pike, found in the Mentasta or Upper dialect, occurs in the Tok River drainage. Pink salmon, chum salmon, needlefish, and hooligan (eulachon) are known in the Matanuska River area or via trade. There is a small degree of lexical variation between Ahtna dialects for the 19 fish species. For example, Arctic grayling (*Thymallus arcticus*) has two terms; the Upper Ahtna term is ***segele***, while the Central and Lower Ahtna term is ***sde' t'aeni***. There are three terms for Dolly Varden (*Salvelinus malma*) in the dialects, and sometimes the Central, Lower, and Upper dialects Ahtna term, ***ts'engastlaeggi***, is applied to rainbow trout.

Up until the end of World War II resident species fish played a much more significant role in the Ahtna diet than currently. Before the war the seasonal round was organized so that Ahtna families spent the fall, winter, and spring at lakes where they could harvest whitefish, grayling, burbot, and trout. These species were crucial to the traditional economy because they were a reliable resource of food that could be harvested practically anytime of the year and could be relied upon as an alternative to salmon if the salmon runs failed. The seasonal round described by many elders for the period circa 1900 to 1950 included fall fishing for grayling and whitefish and winter fishing for burbot and lake trout. But as the Ahtna became immersed in the wage economy they abandoned the old seasonal round and settled permanently in villages along the Richardson and Glenn highways. As a result, by the mid-1950s most Ahtna families no longer visited the old lakeside fishing sites and instead harvested non-salmon fish in streams and lakes

located close to the highway. At the same time they also gave up the traditional harvest method of using weirs and traps, which were made illegal, for the rod and reel (Reckord 1983a: 53-54).

Traditional Knowledge and the Ahtna

The Ahtna people have inhabited the Copper River Basin for at least a millennium (Workman 1976) and have accumulated a great deal of knowledge about the animals, fish, and plants they depended on to make a living. Such knowledge has been variously labeled, but is usually referred to as traditional ecological knowledge (TEK). Inglis (1993:vi) defines traditional ecological knowledge as

> ...[the] knowledge base acquired by indigenous and local peoples over many hundreds of years through direct contact with the environment. It includes an intimate and detailed knowledge of plants, animals, and natural phenomena, the development and use of appropriate technologies for hunting, fishing and trapping, agriculture and forestry, and a holistic knowledge, or "world view" which parallels the scientific discipline of ecology.

Traditional knowledge, like scientific knowledge, is derived from a process of interpreting phenomenal experience that is both natural and profoundly cultural. All humans strive to create a coherent world out of their complex and novel experiences and it is only through the process of organizing this knowledge that human action and survival are made possible (Feit 1988:77-78). By means of culture humans order and condense their experiences into manageable categories to which relatively standardized understandings and rules can then be applied. Thus knowledge in both western and non-western cultures is produced through similar processes. But the knowledge of non-western cultures is not identical to that of the west because it is embedded within its own cultural system. Or to put it another way, it is interpreted in light of a different paradigm (Scott 1996:85).

The Ahtna view of nature is based on a line of continuity between the biophysical, human, and supernatural worlds. Humans and animals (including fish) share the same fundamental

The rules set out in the ***Bac'its'aadi*** story form the ethical basis for the traditional Ahtna management system (see Simeone and Kari 2002:pp37-60) for a description of the management system). In interviews Ahtna elders repeatedly made the point that there is a direct link between the fishing practices of human beings, the survival of humans, and the sustainability of the fishery. In the elders' view the sustainability of the fishery is predicated on how humans demonstrate respect for the fish. Three ways humans can demonstrate this respect are: 1) to take proper care of their fishing gear, including the construction of smoke houses and drying racks; 2) to treat the fish properly after they are caught, including harvesting only what you need, and 3) to behave properly while in fish camp. In her discussion of the ***Bac'its'aadi*** story Ahtna elder Martha Jackson (Ahtna Tape 32) stressed the direct relationship between Ahtna fishing practices and the annual return of the salmon. She says that the only reason salmon exist today is because of how humans treated them in the past. In her terms "[it] is because of the people who work on them (salmon) well, that the salmon still exist now."

> Dae' łuk'ae 'adii ugheldze' ba hghetnaa de yet yaen'.
> /Thus now the salmon run well only for those who work on them carefully.
>
> Yet yaen' 'ungget uyehts'e' telax.
> /Only then do they swim to someone.
>
> Yet koht'aene koht'aene ts'akut'edze' ba hghetnaa de, 'ele' ugheldze' ba hghestnah den,
> /If the people work on them badly, if they do not work on them nicely,
>
> koht'aene its'e' skudetniiyede, 'ele' its'e' tesdlaxe.
> /or if a person is lazy towards them, then they (the fish) will not run to him.
>
> Koht'aene ugheldze' yaatnaade yet yaen' anoxt'e' 'adii łuk'ae łuk'ae c'a yii 'adii c'a xu'a kot'aen.
> /It is because of the people who work on them (the salmon) well, that the salmon still exist now.
>
> Ugheldze' ba hghetnaade yet yaen' łuk'ae c'ilaen.
> /They work on them well, and that is the only reason that the salmon exist.
>
> Kiits'e' skudetniige 'ele' udatahe ugheli ghileh de, yełdu' 'ele' k'adii kestlaxe,
> /The ones who are lazy, or whose gear is not good, do not have fish running to them at this time.

of personal experience on the land compounded by generations of information imparted through oral tradition. Hunters and fishers acquire extensive knowledge of their environment because of the wide variety of activities they undertake in all seasons of the year. Their dependence on animals, fish, and plants requires a detailed knowledge of when and where resources are available and the environmental processes that affect their availability. This breadth of knowledge is reflected in traditional classification systems or taxonomies, which are the basis for building extensive systems of knowledge about nature.

As a result traditional knowledge has a chronological depth that far surpasses that of the written record (cf. Cruikshank 1981:72; Haggan, Archibald and Salas 1998). In general, biological data on subarctic fisheries is "poor" or "non-existent" (Reist 1997:6). Records on non-salmon fisheries in the Copper Basin that predate 1960 are rare and confined to major lakes and streams. As a result managers have short chronologies on which to build predictions or management plans. In chapter three of this report we present information that refers to a time period from about 1870 to 1950 and provides information on the presence or absence of species, as well as their distribution, migration patterns, and productivity. The Ahtna oral traditions presented in chapter four extend this chronology even further back in time and help to create a baseline for monitoring purposes that managers can use to understand long-term changes in the local environment and the fishery and assist in planning and implementing future research projects.

Traditional knowledge also includes observations of the environment that are often more comprehensive, and in some cases more detailed, than those collected by managers. Collectively Ahtna elders have a more comprehensive knowledge of the vast array of streams and lakes within the Copper Basin than do managers, who by necessity focused their research on major lakes and streams where fishing pressure is most intense. In this report the elders provide information on streams and lakes that have never been sampled or assessed by managers, or that managers have only limited information on. Furthermore, because the Ahtna used certain locations over several generations they have detailed observations about species distribution and seasonal movements over an extended period.

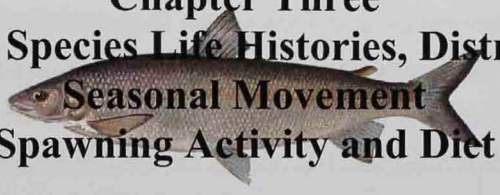
20th century, identify strongly with their traditional territory, which is where their most intimate, detailed knowledge lay. When asked about non-salmon species the elders responded by providing information about specific locations within their home territories and in many instances they refused to talk about places outside their home territories where they had no direct experience.

During several of the interviews the investigators used maps to locate fishing sites. The maps were USGS scale 1:6250. They were laminated and the information was written in erasable ink directly on the maps, a method Dr. Kari has used for the last two decades to collect place names. Dr. Kari maintains the original maps while Ahtna Incorporated keeps a copy.

All of the elders interviewed for this project were fluent Ahtna speakers but were also comfortable with the English language so that interviews were conducted in a mixture of Ahtna and English. Elders were chosen based on their experience on the land, all had grown up in a largely subsistence economy in which they had to fish, hunt and gather to make a living, and because of their knowledge of the Ahtna language. Investigators conducted both directed and semi-directed interviews but favored the latter because semi-directed interviews allowed for the collection of a wider range of information. In addition, semi-directed interviews enabled the interviewees to discuss their understanding of the topics and make connections between topics based on their own logic rather than on questions drawn up in advance (cf. Huntington 1998:241). Interviews ranged in length from one to three hours and respondents were offered an honorarium in recognition of their time.

One explanation for why it is so hard to make use of traditional knowledge in resource management is because TEK is too different from science in terms of content and expression. In writing this report one major concern was how to present the information so that it would be useful to resource managers while maintaining an Ahtna voice or perspective. A major difficulty in bridging the gap between TEK and science is appreciating different styles of communication. In Ahtna culture narrative plays a key role in the transmission of knowledge. Narratives usually range over a wide set of topics and do not always lend themselves to quick, easy, absorption. To write this report we dissected the narratives and organized them into discrete chapters on specific

Chapter Three
Resident Species Life Histories, Distribution, Seasonal Movement Spawning Activity and Diet



This chapter covers Ahtna knowledge of the life history of non-salmon species fish. It is organized around topics familiar to many biologists such as species distribution, the presence or absence of species, migration patterns, and spawning activity. When Ahtna elders talk about fish, or any animal, they usually discuss them in relation to the harvest, and when talking about the harvest they frequently confine their most detailed remarks to their own home ranges or territories and to specific areas and sites within those areas. These are locations that, up until relatively recently, Ahtna families utilized over succeeding generations. As a result the elders who talked about these places had comprehensive and intimate knowledge of that place and the animals and fish associated with that place. Besides describing specific harvest sites (which are identified by place name), Ahtna elders also talked about small streams and lakes, many of which have no English name. Note, as discussed earlier, in the late 1940s and early 1905s the Ahtna altered the traditional seasonal pattern and stopped fishing in lakes and streams away from the road system so the harvest sites identified in this chapter were used primarily before World War II.

Fishing sites for non-salmon species are located throughout much of the Copper Basin and upper Susitina Drainage. During this project the investigators flagged fishing sites identified by place names as F1= salmon harvest sites, F2 = non-salmon fish harvest sites (other than whitefish), F3 = whitefish harvest sites, F4 = salmon and non-salmon harvest sites, F5 salmon and whitefish sites, F6 = all species of non-salmon fish, and F7 = harvest sites for both non-salmon and salmon species. Numerous fishing sites can fall under the domain of one place name so that along a linear feature such as a stream there maybe several fishing sites under one place name. Of the 2000 place names on the Ahtna Place names list (Kari 2004, draft), 495, or nearly 25 percent, have fishing sites affiliated with them.

Central Ahtna territory dedicated solely to the harvest of whitefish (F3). By contrast there are 12 sites in the upper Susitna drainage where whitefish were the only species harvested. In Upper Ahtna Territory there were 55 sites (F2 and F6) where only non-salmon species could be harvested and no sites devoted exclusively to the harvest of whitefish.

Accompanying the text are four maps. The first provides an overview of non-salmon fishing sites within the larger Ahtna territory (Figure 3). Maps two and three show historic fishing sites in the territory of the Middle and Upper Ahtna, while a fourth map depicts historic sites in the upper Susitna drainage, which is in the territory of the Western Ahtna. There is no map for Lower Ahtna territory because there are only a few non-salmon fishing sites located on the lower Copper River. Most of the place names mentioned in the text are numbered and these same numbers are keyed to the map. Larger bodies of water such as Crosswind Lake and Lake Louise are not numbered. Note that the paucity of names for the Lower Ahtna reflects the depopulation of the lower Copper River within the last century. Ahtna no longer inhabit the Chitina River drainage.

Resident Species Distribution and Fishing Sites

Middle Copper River, Central Ahtna Territory

Figure 4 shows streams, lakes and fishing sites located in Central Ahtna territory discussed in the text (Table 3 lists streams, lakes, fishing sites and species harvested). There are 45 fishing sites listed for the middle Copper River indicating the comparative density and richness of non-salmon fish for this region as compared to the lower and upper Copper River. Of particular importance are the Crosswind Lake and Ewan Lake systems, and the Tyone River system.[1] Both are known throughout the entire Ahtna region for an abundance of non-salmon species, especially whitefish. Crosswind Lake is deep, does not freeze to the bottom, and the north outlet

[1] Note that Tyone Lake and Lake Louise are considered part of Western Ahtna territory but for convenience we have included them in the discussion of the Central or Middle Ahtna.

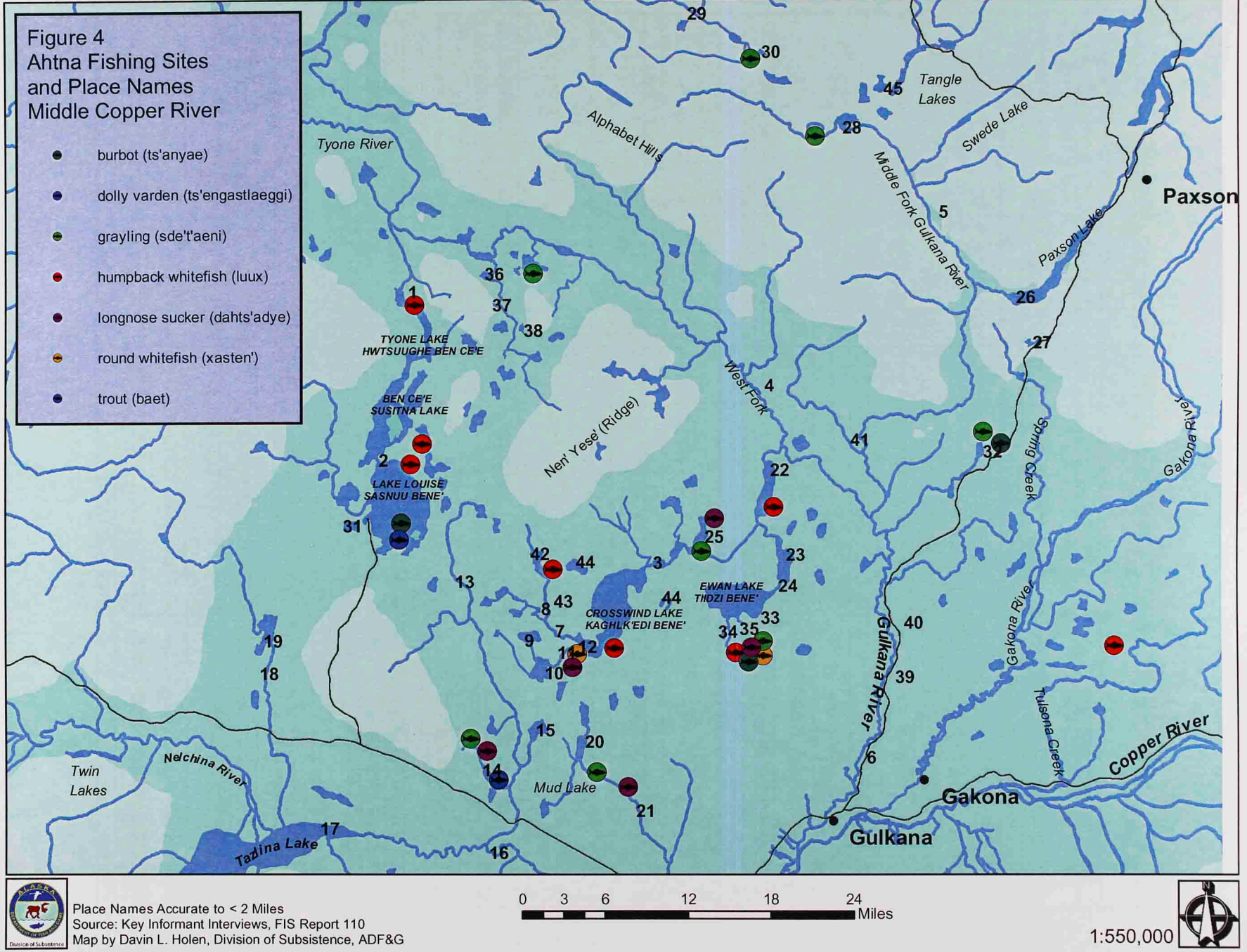


Figure 4
Ahtna Fishing Sites
and Place Names
Middle Copper River
burbot (ts'anyae)
dolly varden (ts'engastlaeggi)
grayling (sde't'aeni)
humpback whitefish (luux)
longnose sucker (dahts'adye)
round whitefish (xasten')
trout (baet)
Tyone River
Alphabet Hills
Tangle Lakes
Swede Lake
Middle Fork Gulkana River
Paxson
Paxson Lake
TYONE LAKE
HWTSUUGHE BEN CE'E
BEN CE'E
SUSITNA LAKE
LAKE LOUISE
SASNUU BENE'
Neni Yese' (Ridge)
West Fork
Sourdough Creek
Gakona River
EWAN LAKE
TIDZI BENE'
CROSSWIND LAKE
KAGHLK'EDI BENE'
Gulkana River
Gakona River
Tulsona Creek
Copper River
Twin Lakes
Nelchina River
Mud Lake
Tazina Lake
Gakona
Gulkana
0 3 6 12 18 24
Miles
1:550,000
Place Names Accurate to < 2 Miles
Source: Key Informant Interviews, FIS Report 110
Map by Davin L. Holen, Division of Subsistence, ADF&G

can be kept open throughout most of the winter, so fishing can take place throughout much of the year. The prevailing south wind keeps the outlet at Ewan Lake open.

Historically, Ahtna had several permanent habitations at both ends of Crosswind Lake but most were abandoned in the 1950s after the Ahtna took up wage labor and settled permanently into villages located on the highway system. Today there is only one camp at the north outlet of the lake. In 1969 the State of Alaska closed Crosswind Lake to all subsistence fishing, ostensibly to protect the growing sports fishery. Fred Ewan (Ahtna Tape 135), who grew up around Crosswind Lake in the 1930s and 1940s at ***K'estsiik'eden*** (3) or 'outlet place' (also called ***K'estsii'i***), and who still has a house at the north end of the lake, says that Crosswind Lake is good for fishing because whitefish are available throughout most of the year and relatively easy to catch compared to grayling, which leave the lake in the spring scattering into smaller streams and ponds to spawn.

> It [whitefish are] living there [Crosswind Lake] all the time. It not like hard work [to catch whitefish] like the other fish.
>
> Other tsabaey łdu' 'adii tatestlaexi gha 'ele' ugheli ghileh 'adii you know.
> /The other kinds of fish, as they start to run in the water, are not very good.
>
> Gaat datsuughe sde' t'aeni 'adii tedełi, si' k'ent'ae, si' k'ent'ae.
> /Here below as the grayling start to run, they are like birch sap.
>
> K'uun' nanlaesdze' you know. K'ey't'aen dze'.
> /They are laying eggs, you know, as they are like this.
> They laying eggs now you know.
>
> Uk'uune' hwngelggaes dae' su de denek'uune' hwngelggaes su t'aen
> /The eggs spread out, their eggs get scattered out as they do that.
>
> Hwngalggas, 'adii [in May June, grayling lay eggs.]
> /They spread over the area.
>
> Not whitefish. Whitefish all summer [are available all summer].
>
> Łuux 'ele' xu' st'aene. łuux łdu' one place k'a delts'ii 'utggu, deep lake,
> Ben Ges yii, łi'ke Bene'.
> /Whitefish are not like this. The whitefish stay in one place, in deep lakes, such as in Ben Ges (lake south of Dog Lake), or 'Dog Lake'.
>
> You know, Fish Lake yii. Just little area.
> Maybe twenty-mile area he live in there.

(***Ndez'aayi***) (15) has no fish. Tolsona Creek itself has few fish. It flows into the Tazlina River (***Tezdlen Na'***) (16) and a few grayling come into Tolsona Creek via the Tazlina River and stay until August. There are a few whitefish in the Tazlina River that go all the way into Tazlina Lake (***Bendilbene'***) (17). There are salmon in Mendeltna Creek (***Bendilna'***) (18) and some grayling, but no whitefish. Old Man Lake (***Bendaes Bene'***) (19) has salmon that come in from Tazlina Lake. The Moose Creek -Twin Lakes system has only grayling and sucker, but no whitefish. In the spring the fish move downstream out of the Twin Lakes (***Hwdaandi Ndaa' Bene'*** and ***Hwniindi Ndaa' Bene'***) (20) into Moose Creek (***Ciisi K'ena***) (21) and in August they return upstream.

Frank also provided information about Ewan Lake. Several species of fish moving through the outlet of Ewan Lake (***Tatggat***) can be harvested throughout most of the winter. Ewan Lake is connected to Fish Lake (***Hwghil'aa Bene'***) (22) and Middle Lake (***C'obeni)*** (23) through Middle Lake Outlet (***C'obeni Na'***) (24). Frank says there are whitefish running all winter long through this outlet. Because the water is fed by warm springs, grayling run in the small creeks as late as the month of October and Frank said that Ewan Lake is one of the few places where grayling could be caught during mid-winter. In January and February it is also possible to catch quantities of burbot that eat the grayling. Then in about February rainbow trout start to run. In addition Frank mentioned streams that flow into the south end of Ewan Lake, such as ***Tatggey Na'*** (34), ***Kuyxi Na'*** (35) (Whistler Creek), and ***Key Nuu Na'*** (33) (Bird Island Creek), which has grayling, some sucker, and lots of burbot.

In the system encompassing Fish Lake (22), Dog Lake (***Łi'ke Bene'***) (25), Middle Lake (23) and the upper outlet of Crosswind Lake there are whitefish, grayling and sucker, which run until November. Frank added that round whitefish (***xasten'***) come into the system via the Gulkana River.

Frank noted that there are sites located in the vicinity of Hogan Hill Lake (***K'ey Tsaay Bene'***) (32) that have good grayling and burbot fisheries, but few if any whitefish. Paxson Lake (***Tak'ats' Bene'***) (26) has grayling and salmon, and Frank thought there might be some whitefish. Tangle Lakes (***Nitilbene'***) (45) has lake trout. Meires Lake (***Hwdagguus Bene'***) (27)

attract the fish. At the south end of Ewan Lake is a creek called ***K'ey Nuu Na'*** (33) where they catch grayling, burbot, long nose sucker and whitefish. Another creek called ***Taatggey Na'*** (34), that flows into the end of Ewan Lake has the same kind of fish, as does the creek call ***Kuyxi Na'*** (35) ('Whistler Creek'). That has "lots of grayling, lots of lingcod [burbot], little sucker, that big, " Andy said.

The lake district north east of Tyone Lake has a variety of fish. Suckers are available at ***Nac'etkasi*** (36), a place located about ten miles from Tyone Lake, and there are whitefish in ***Da'sc'elaes Na'*** (37) or "Boat Creek," which drains into the West Fork of the Gulkana River. The area to the north and between Crosswind and Tyone lakes was once used in the late fall for grayling fishing. Andy also mentioned a creek flowing out of a lake called ***Niygge*** (38) that has very good grayling fishing.

Ben Neeley (2003), who now lives in Gulkana, calls himself ***Hwtsaay Hwt'aene***, literally "Small Timber People", the western most band of Ahtna. Ben was born in about 1920 on the upper Gulkana River and lived for many years on his land at 142 mile on the Richardson Highway. He remembers fishing at ***T'ox Na' Ce'e Bene'*** (39) or Poplar Grove Creek Lake and ***Scent'aa Na'*** (40), the stream at 142.5 mile where his father used to have a fish trap for grayling.

> Spring time right after break up, big grayling. Big grayling, black, used to come up, in springtime. That [the grayling] went by then, the sucker come up. Big sucker too. That's pretty good. But they don't last, only springtime. Only time, [May month].

Ben's father, Tom Neeley, also had a cabin and fishing site at ***Taltsogh Cae'e*** (41), a stream with grayling, sucker, and burbot, that flowed into the main stem of the Gulkana River from the west and about three miles above the mouth of the West Fork.

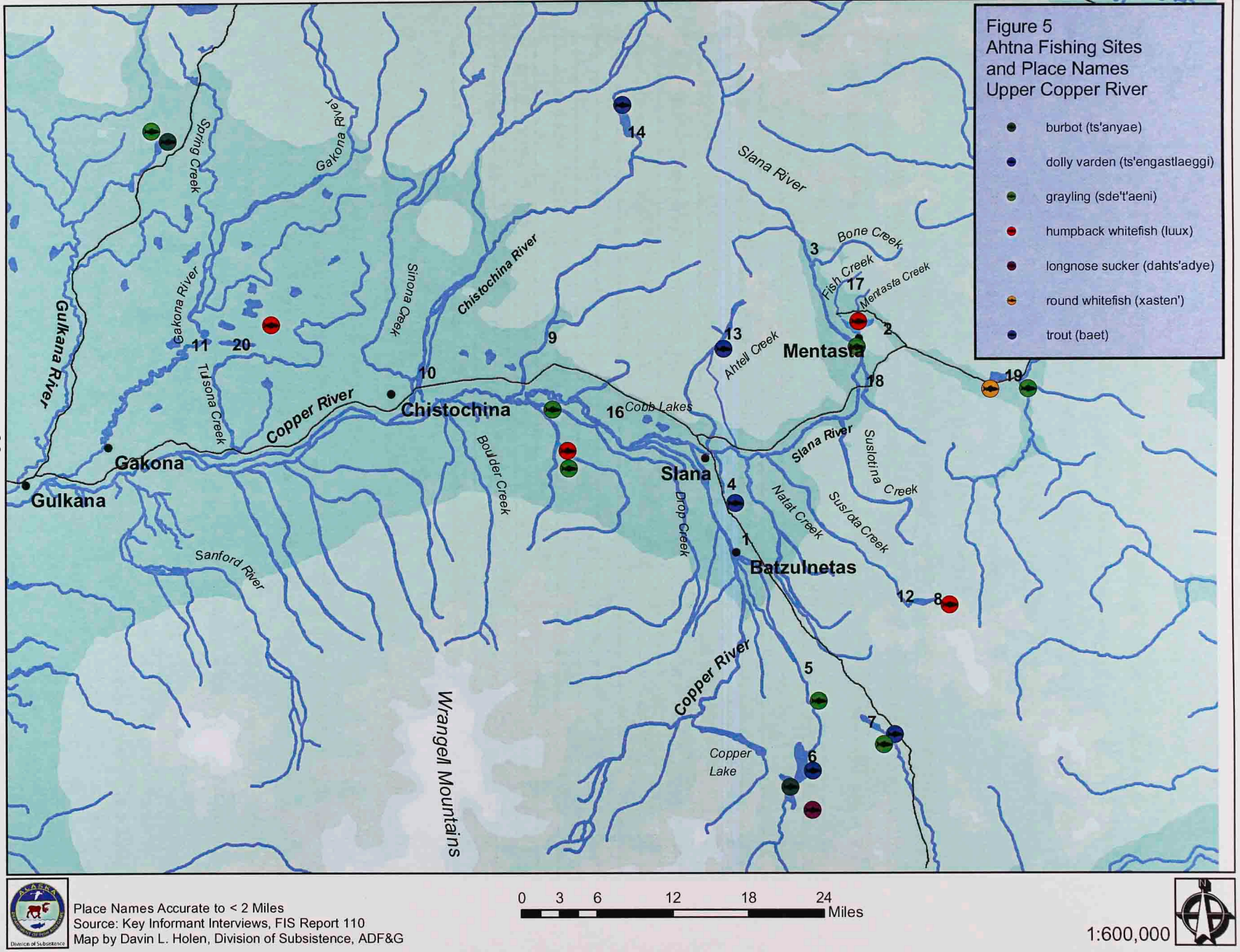


Figure 5
Ahtna Fishing Sites
and Place Names
Upper Copper River
burbot (ts'anyae)
dolly varden (ts'engastlaeggi)
grayling (sde't'aeni)
humpback whitefish (luux)
longnose sucker (dahts'adye)
round whitefish (xasten')
trout (baet)
Gulkana River
Gakona River
Gakona River
Spring Creek
Tulsona Creek
Sinona Creek
Chistochina River
Copper River
Chistochina
Gakona
Gulkana
Boulder Creek
Sanford River
Wrangell Mountains
Cobb Lakes
Slana River
Slana
Drop Creek
Natat Creek
Susiotina Creek
Susiota Creek
Batzulnetas
Copper River
Copper Lake
Bone Creek
Fish Creek
Mentasta Creek
Mentasta
Ahtell Creek
Slana River
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Place Names Accurate to < 2 Miles
Source: Key Informant Interviews, FIS Report 110
Map by Davin L. Holen, Division of Subsistence, ADF&G
Division of Subsistence
0 3 6 12 18 24
Miles
1:600,000

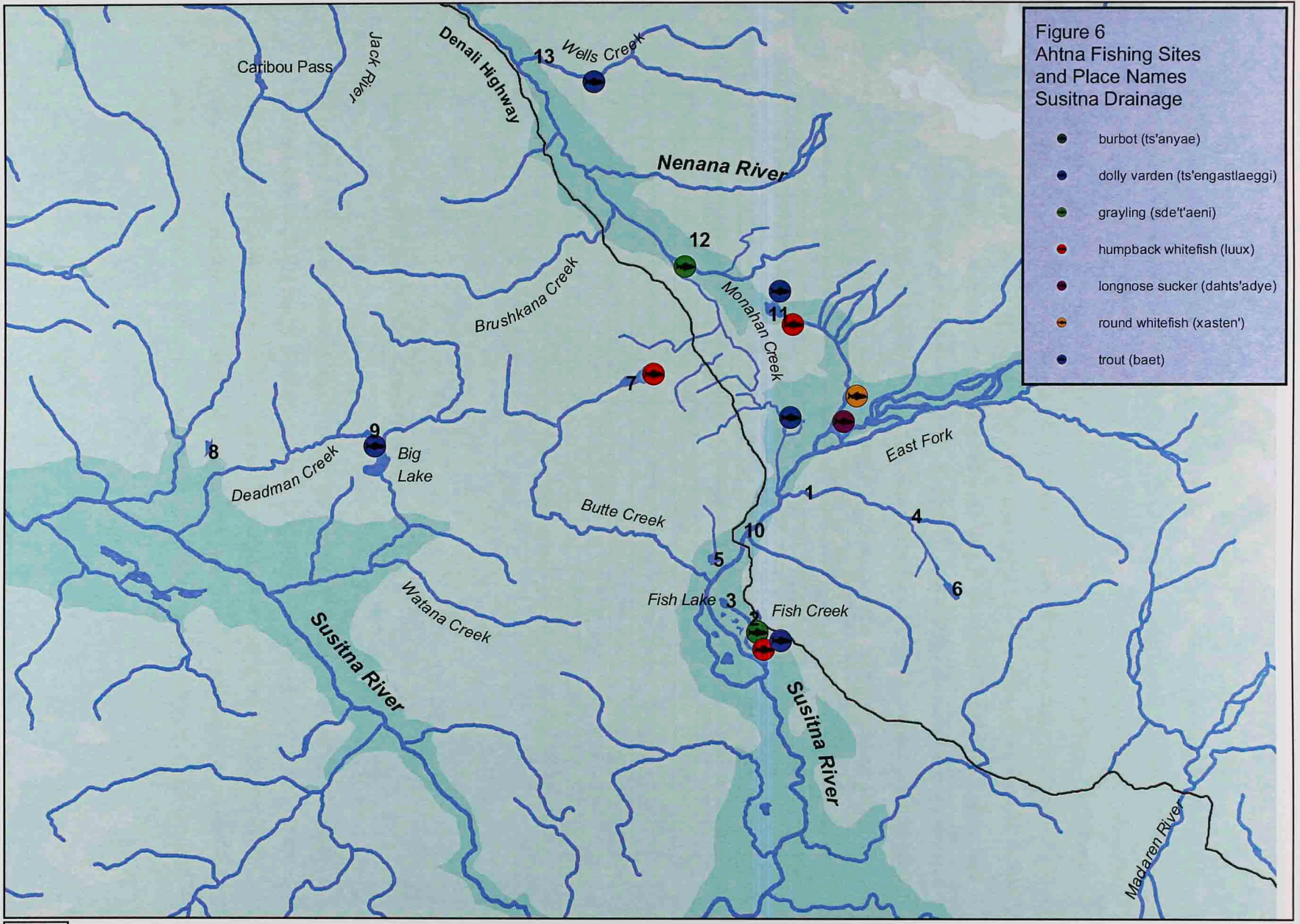
(***Nataeł Na'***) (5).[3] No whitefish are found in Tanada Lake (***Tanaadi Menn'***) (6), and Katie thinks this is because of the giant lake trout or ***baet*** that live there. There are also sucker (***tahts'adiye***) and burbot (***ts'aann***),"[T]hat's what they fishing for winter, through the ice," Katie said. There are some big burbot in Tanada Lake, which is very deep at one end. The deep end is also home to the biggest grayling and lake trout. At Jack Lake (***Tadinilts'aegge Menn'***) (7), off the Nabesna Road, there are trout and grayling. Suslota Lake (***Sasluuggu' Mene'***) (8) has whitefish that were harvested in the past but according to Katie, they were small and of poor quality. Until the first decades of the 20th century there were two villages located on Suslota Creek, one where the creek enters the lake and another down stream from the lake. Today neither village is inhabited and there are no fishing sites on the creek.

Katie also added information about fish populations in areas further down the Copper River. She said there are no whitefish in Indian River (***Di'idaedl Na'***) (9), or in the Chistochina River (***Tsiis Tl'edze' Na'***) (10), but whitefish are found in the numerous lakes at the head of the Gakona River (***Ggax Kuna'***) (11).

Bell Joe (Ahtna Tape 110) was born in the village of Suslota (***Sasluuguu'***)(12) on the upper Copper River, but now lives in Chistochina. According to Bell there are lake trout (***baet***) in Crosswind Lake and in ***Men Tl'ets*** (13) the lake in Indian Pass. "They got some ***baet*** at Mankomen Lake (14) and Tanada Lake (6) too." He added that there are grayling in a creek called ***Tsabaey Na'*** ('Fish Creek') (16) at 42 mile on the Tok Cutoff. The Slana River has both humpback whitefish (***łuux***), and round whitefish (***xasten'***). On Fish Creek (***Tsabaey Na'***) (17), which flows into Mentasta Lake, Bell said he put in a fish trap to catch round whitefish, suckers, grayling, and humpback whitefish, all at the same time. According to Bell the same holds true for Mabel Creek (***Tacdlaxa Na'***) (18), which flows into the Slana River. Bell also reflected on whitefish found off the lower Gakona River at "Gene Lake" or ***Nedzighilen Bene'*** (20). This is the only reported whitefish-harvest site in between the two main Ahtna whitefish districts of the Slana River area and the Middle Fork of the Gulkana River. Bell said:

---

[3] In addition to grayling, Tanada Creek has sockeye salmon (***łuk'ae***), but there are no chinook (***łuk'ece'e***) or coho (***xay łuugge'***) (John 1988, Simeone and Kari 2002).



Place Names Accurate to < 2 Miles
Source: Key Informant Interviews, FIS Report 110
Map by Davin L. Holen, Division of Subsistence, ADF&G

0 2 4 8 12 16 Miles

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humpback whitefish in ***Xanc'eltl' aes Na'*** or "Fish Creek," (2) a system of sloughs that flows out of ***Xanc'eltl' aes Bene'*** (aka "Peter's Lake") (3) into the Susitna River just south of the Denali Highway near Susitna Lodge and about one mile west of Swampbuggy Lake. This was an important fishing site that archaeological evidence suggests has been used since prehistoric times (cf. Betts 1985). James Sinyon (West Tapes 1973) also described ***Xanc'eltl' aes Na'*** (3) as a rich fishing site located right on the flat where there were no trees or brush. According to Jake round whitefish are found on the Upper Susitna at Fish Creek, at ***Ben Datgge' Na*** ('upper lake creek') (4), at ***Xanc'eltl'aes Bene'*** ("Peter's Lake") (3), and at ***Ben'sdeltsiini*** (Snodgrass Lake) (5). Jake said that some burbot were in the Susitna River as well. Dolly Varden and lake trout are found in Roosevelt Lake (***Bedlaexi Bene'***) (6). Some whitefish and burbot are found in Butte Lake (***Hwniidi Ben***), (7) but only lake trout are found in Tsusena Lake (***Nts'ezi***) (8) and Deadman Lake (***Kacaagh Bene'***) (9). There are no pike in the upper Susitna River. According to Jake whitefish are found in ***Benhwdił'aade*** (10), located west of the Susitna River across from Valdez Creek; and in the drainage coming from ***Ben Datgge' Na'***(4); the lakes west of the West Fork of the Susitna River and opposite Valdez Creek, and ***Tabenł'aa Bene'***(11) the large lake west of the West Fork of the Susitna River. In creeks running through Monahan Flat (***Cetakolyaes Cene'***) (12) there are only grayling. Longnose sucker are found in a slough off the West Fork of the Susitna as well as in local lakes. Bullhead, or slimy sculpin, is rare. Some are seen in Wells Creek (13), and Jake does not think there are any eels in the upper Susitna drainage.

Lower Copper River, Lower Ahtna Territory

In contrast to other regions of Ahtna territory, the Copper River below Copper Center has fewer resident species fish (Map 2). Henry and Etta Bell (2000), who live in Kenny Lake, said there are a few round whitefish in the lower Copper River and a few humpback whitefish in the Tonsina River (***Kentsii Na'***). But, they added, in the past these fish were never dried for food. In the spring, before the salmon arrived, people harvested burbot and grayling in the Tonsina River.

Xona ghe ye ben yiic'a I guess naynelaes fall time you know.
/So then they lay their eggs in the lakes in fall time.

Tsabaey su kalax su just nen' c'a' 'edahwdełniis ts'etnii.
/The fish swim up and in the country they make a noise, we say.

Just like thunder you know.

Łteni nandełi gha yet.
/There is thunder striking right there.

So many fish in there. Just wooo you know. When he scare away you know (that is, when something disturbs them).

When talking about fishing for burbot (***ts'anyae***), Fred (2002) said he was told that they spawn in rocky places. He also noticed that when setting out muskrat traps the burbot tried to bite the traps (meaning that they were feeding in the spring).

We fishing, I fishing ts'anyae easy, Indian way. With hook, different, we have to put bait on. Sand in there, I put **ts'anyae** bait on there with hook, I couldn't get it, why?

Some Indian told me, only rock place it is easy to get **ts'anyae**. That is where it lays its eggs, they just go around there, in rocky place. I trap for muskrat on lake shore, rocky place, at Crosswind Lake. Everytime I see big ling cod in there. He try to bite that muskrat trap. We get it with hooks where we see lots of em, snag em. With flashlight [during the night]. That's a big fish ts'anyae.

Where I got cabin, I make **hwtsiił** bridge across, that where we get it.

Frank Stickwan (Ahtna Tape 131) also describes the movement of grayling (***sde' t'aeni***), humpback whitefish (***łuux***), round whitefish (***xasten'***), and long nose suckers (***dahts'adyeh***) in the area around Crosswind Lake. According to Frank, fish generally migrate in the spring from large, deep lakes into the adjacent smaller lakes to the south and west. Grayling move in May as soon as the ice leaves (between May 1 and 20) and return in September. Humpback whitefish and sucker also migrate in the spring, after the grayling, and return to the deep lakes sometime in mid-summer. Specifically, Frank stated that in the spring grayling, sucker and some humpback whitefish migrate out of Crosswind Lake through ***Kanilen Na'*** (12) ('Flows Through Creek') and into Game Trial Lake where they spend the summer. In September they migrate back to

Upper Copper River

In an interview recorded in 2000, Katie John provided some general comments about the seasonal movement and spawning of whitefish in the upper Copper River. She stated that when a lake has an outlet stream that goes into a river, whitefish move into the river during the summer. However, if there is no river whitefish follow creeks leading into lakes. Whitefish follow streams and might spawn in the stream if a river is unavailable. Katie (Ahtna Tape 120) also indicated that whitefish were feeding heavily in June. In May the fish were "poor, not good to keep" but in June they were getting fat. Katie noted that the "best time for ***tsabaey***" (whitefish) was "pretty near last of June into up to July. That time fish get fat and got eggs same time."

In the Slana River drainage, Katie said that whitefish leave Mentasta Lake in May and go down Mentasta Creek into the Slana River. They continue to migrate until the middle of June, spending the summer in small lakes and side streams. Then in October they move out of the lakes and head to the upper Slana River where they spawn.

> Katie: Daan'tah tsabaey na'aay' kalax.
> /In springtime they [whitefish] swim down during "fish month" [May].
>
> T'ae' lk'aax, lnes.
> /They are really fat and tasty.
>
> Q: Which way are they going then?
> Katie: They are going down the creek then. End of May until middle of June.
>
> When we stay at old village [at the lake outlet], all summer from May all the way down to October we get whitefish. October he start to grow and laying eggs, then he head to Slana River. That's where he spawn, up the Slana River. That's why October he all fishing at Slana River at night, nighttime. From this way they have a road all the way through. Where old bridge cross that one wash out but right there, they always fishing.

Katie John (2002) also thinks that whitefish (***łuux***) prefer to over winter in lakes with algae and muck on the bottom:

> Mentasta Lake you don't see sand around. But just only halfway this way. They got some rock and sand around and other way nothing. Banaznaeta (Tanada) Lake all just like a river along side, all sand and rock and no whitefish there that kind of lake. And Jack Lake same way. And this one from Fish Creek one side. But we still got no whitefish. And I think about where there is no sand in the water I think that is only place where he can be. Where there is **tahtlok** [mucky algae], anything **neyaexi, yii tah** [that is growing in there] maybe he got food there.

According to Katie whitefish hibernate in Mentasta Lake by burying themselves in the mud/slime (***tahtlok***) at the bottom of the lake. The fish hibernate for one month. Katie said that the month of March is known as ***Unen Tic'elaxa*** [Lit. 'month they swim out'] referring to the fact fish have ended their "hibernation." The month of May is known among all Ahtna as ***Tsabaey Na'aaye'*** [lit. 'fish month'] "you know all the fish come out and spawn, fish come out of every little creek." She also notes that the reason there are no whitefish in Tanada Lake is because of the population of lake trout that would eat the whitefish. She also points to the wide distribution of grayling, which are found almost everywhere.

> You know tsabaey men yiit tsabaey delts'ii naxu niłk'eze ghaltsiił dze'
> /The fish that stay in [Mentasta Lake], are of different varieties.
>
> Tsabaey segele, ts'aann, di'e tsabaey men yii delts'ii ninatdax.
> /Whitefish, grayling, lingcod are the fish that stay in the lake. They hibernate.
>
> Just like bear went in [den] in the fall. Just like that.
>
> Tuu yii den
> /in the water is a den there
>
> I don't know nts'e keyuzii tahtlok naene ts'ene.
> /How do they call it, we say algae/slime [on lake bottom]
>
> Like ground kind of slimy kinda color, we call tahtlok.
>
> Yii xuyt'aax tah ninatdax.
> /They [the fish] stay in there.
>
> And for one month he do that. That's the one he used to call **unen tic'elaxa**.

Down backwards going down that's all yeł de tez'aani yiit yitayłdiił.
/As they (the whitefish) are going back downstream, that is the only time that they put the fish trap into the water.

In the following section Jake Tansy (Ahtna Tape 127) describes the movement and behavior of whitefish in various situations. According to Jake whitefish do not go in a downstream direction when there is too much current. They can "float" only when their head is facing into the current. A fish facing downstream has less control over the water flowing through its gills and can drown.

Diniłeni c'edaa'a li'i tiye łoosdełe.
/They do not go in a downstream direction when there is too much current.

Dae' tanaa cu utse', utse' tanaz'aan dze' yaene' natayteyes.
/With his head against the current, [facing upstream] that is the only way that it can float.

Ucela' tle dae' dae' c'a xona yehwk'e dadaa'a ts'e' fast going down too.
/His tail (it flips) and goes down stream fast.

Dae' tuu k'e daa' tsighel'aan de' łi gaa duughe du' duughe open nt'ae,
/Thus on the water if the (fish's) head is downstream, it is open.

Duu xuhwts'en ts'es tuu k'e daa' tsighel'aan de li'i ugheldze' sts'ese 'udetnii.
/On that side in the water he is breathing, but if the head is downstream it cannot breathe well, it is said.

Yet tanaa gaa unannitnighilen dze' yaen' ugheldze' ts'es
/There when the current is flowing against them can they breath well.

K'adii spring time tanaa talet tadeł,
/Now in springtime they will go against the current of the melting water.

In the fall go back to the ts'itu' ts'inatedełde.
/In the fall time they come back out to the main river.

Cit'aadze'xu c'a natayteyes.
/Then they are moving as a group (i.e. in a school) the opposite way.

Dae' su t'iix.
/That is what they do.

Diigha tez'aani yideli c'a cit'aa'a dze' su dataydiłdeł.
/That is why as they go into the fish trap, they are moving the opposite way.

Hwdahdułdiłdeł su hwnihwdeltiix.
/They are passing going down at this time.

they opened the dam just enough to let the fish escape. When the beaver came around to repair the break the Ahtna chased the beaver away until the fish had escaped. Fred had never seen fish that had frozen to death behind a beaver dam because when the dam was opened the fish knew they had to escape. In very cold weather the beaver moved out of the lakes and into neighboring creeks. Fred pointed out that they managed the situation to benefit both the beaver and the whitefish and to make certain both survived. He remembered that hunters would break open beaver dams in the fall at Crosswind Lake and Horseshoe Lake (44) (Figure 4). Beaver dams were not opened in the spring; instead the Ahtna relied on high water to wash fish over the dam.

Q:How about beaver dams? Did the Natives take care of beaver dams?

Yeah, Di'sghalaes cu ts'eɬ'iis, di'sghalyaa xu, fish de idahwdeɬtsiis dze'
/We open them up. We keep them open, they (beaver) can block off the fish.

Little lake yii all freeze to death you know. Not much deep lake he (fish) freeze to death.

In the lake 'ele' ubene' i'ghilae, he know that.
/It (beaver) does not (stay) in the lakes, [beaver prefer the creeks in cold weather]

Q: Where did they do that [open up the beaver dams]?

Crosswind Lake and this side, Horseshoe Lake, this side three miles, I got cabin there too.

Dats'ii c'a yet hwnax ɬ'aan. Lotsa [muskrats] rats there. Dzen dzaxdze' c'ilaen. Nek'eyɬ'aay Bene' ('birch extends around lake').
/I still have a house there. There are lots of muskrats, [at] 'birch extends around lake.'

Nek'eyɬ'aay Lota birch tree you know.
/'Birch extends around lake'

Q: You see the beaver cut off the creek and block the fish?

Oh yea.

Q: So what did they try to do?

They [beaver] make a dam you know. Not fall time, [we] give em time, pull it out of there and give it time. You don't want to kill beaver.

Den ɬdu' titnaxdze ɬdu' fish na'udeɬde ɬdu' we close it [the dam] back up.
/When they (beaver) tire [we open the dam], then the fish pass by, then we close them back up.

> No I never see that. He [the fish] knows he have to go back into deep water. When we open, he knows. Pretty fast you know, he comes out night and day.

Fred does not recall that floods or high water ever caused problems at Crosswind Lake. The upper outlet never froze, according to Fred, and fish could go back and forth all winter. Fred said that nothing ever interfered with fishing, but if they did have trouble they could harvest fish from other lakes, such as "Three Mile Lake" (located east of Ewan Lake). They could either build a weir or open up a beaver dam to create a sluice or shoot (***uk'e day'stlaexi***) so that fish behind the dam are caught in the rush of water and flushed down stream. This was done in the fall.

Shallow water, and sometimes the lack of water, could also prevent fish from migrating. Frank Stickwan (Ahtna Tape 131) described how in the spring of 1924 he was hunting muskrats and saw that ***Kanilen Na'*** '(12) Flow Through Creek' had no water and the fish had died (Figure 4). Frank also said that beaver dams also blocked streams causing fish to be trapped in shallow lakes where they froze. Beaver also stopped the flow of water in creeks so that fish could not move. If people needed fish to eat they chopped a hole in the beaver dam to let the fish escape. On most occasions they let rising water flowing over the dam wash the fish into the creek. Smaller fish are more apt to be stopped by beaver dams.

According to Katie John (2002), beaver dams in the vicinity of Mentasta Lake have, in recent years, obstructed the movement of fish and caused problems with erosion. Katie had the following to say about beaver and beaver dams:

> That's what he did Mentasta Creek now. But [the dams have] all wash out. And beaver ruin it all that river. Mentasta Creek outlet. He make bridge [dam] and that water coming and tear all this side. And wash away. I don't know now how he doing that. And Fish Creek too he dam it up, up there. We got one beaver dam down by lake.

On the lower Copper River beaver dams have also obstructed the movement of fish. According to Robert Marshall (2003) grayling and sockeye used to migrate through Town Lake in the town of Chitina into First, Second and Third lakes. Robert said

Katie John (2002) says that whitefish, like grayling, eat bugs that land on the water, and leeches.[7]

> I think where [there is] beaver dam, I think it's where they run. Where there are bug, everything. Get there, fall in the water. They go close to beaver dam in the summertime. Just like grayling. They catch butterfly, anything that get in the water.
>
> And they got lot a little water snake [leech] underwater. Little live one. They eat all those things. But **łuk'ae** [sockeye salmon] I don't know what he eat. He eat something.

Summary

This chapter has provided basic information on the distribution, seasonal movement, and spawning activity of non-salmon species found in their particular home territories. Historically humpback whitefish and Arctic grayling were the two most important non-salmon species for the Central, Western, and Upper Ahtna. Quantities of humpback whitefish were harvested during the summer and fall using dip nets and basket traps. Whitefish were singularly important because they could be harvested throughout much of the year, were very nutritious, and could be easily stored. Grayling, while abundant, were widely disbursed during the summer and could only be harvested in quantity for a few days in the fall. Humpback whitefish are not evenly distributed throughout the Copper Basin. On the lower Copper River these fish are scarce so the Lower Ahtna made use of the substantial populations of steelhead, in addition to grayling. To a lesser extent the Ahtna also harvested Dolly Varden, rainbow trout, lake trout, longnose sucker, burbot and round whitefish. The only fish not eaten were bullhead or slimy sculpin. According to Ahtna oral tradition least cisco were once available in Mentasta Lake.

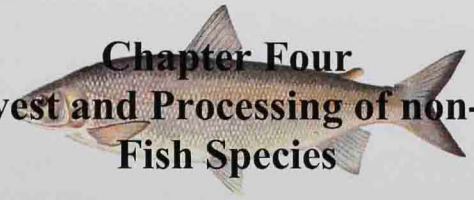
The heaviest concentration of non-salmon species fishing sites was in the territory of the Central

[7] According to McPhail and Lindsey (1970:84) whitefish are bottom feeders that eat mollusks and larval insects while grayling are generalists and eat just about anything. However, some whitefish are not bottom feeders but do eat pelagic and surface foods.

deep lakes. Katie John (2002) thinks that grayling, whitefish, and burbot over winter in Mentasta Lake which has a mucky on the bottom and that the fish bury themselves in the muck. Both Katie and Frank Stickwan observed that during the winter fish tend to be still and not move. Katie made the analogy to bears hibernating. Fisheries biologists know that whitefish probably spend most of the winter in deep water, but they are uncertain why or what they do there (Brown 2003). They have observed that whitefish in the Arctic fast during the winter and feed in the summer (Schmidt et al. 1989) and this fits with the elders observations that whitefish are thin in the spring and fatten up through the summer. There is no evidence that supports or contradicts Katie's view that fish bury themselves in the muck.

Elders said that the movement of whitefish and grayling was keyed to certain indicators. Lake ice conditions heralded the movement of fish in the spring while fall movements were keyed to changes in plants and snow falling on open water. Little is known about how temperature effects the movement of whitefish, but the elder's comments do indicate that changes in water temperature may have an effect on the movement of fish. The Ahtna also monitored other indicators that provided information on when to start and stop fishing. For example, Ahtna elders reported that they monitored the reproductive condition of the fish and their fat content in order to decide when to fish. In late spring and early summer both male and female whitefish were harvested but as the season progressed, and the female whitefish got closer to spawning the Ahtna selected male whitefish over female whitefish, which were considered too poor to keep. The observation that the females decline just prior to spawning agrees with the observations made by fisheries biologists.

The elders' observations that whitefish spawn in the fall and grayling in the spring also agree with those made by fisheries biologists (Brown 2003:7). However the elders did note differences in where whitefish spawned. Fred Ewan, who is familiar with the Crosswind Lake area, thought whitefish spawned in lakes while Katie John, who is from the upper Copper River, said that whitefish spawn in the upper Slana River or in small side streams. Katie's observations are in line with those of fisheries biologists that whitefish spawn in flowing water (Ibid.). Elders noted that their knowledge of the whitefish's diet is based largely on their observations of the stomach



Chapter Four
The Harvest and Processing of non-Salmon Fish Species

This chapter covers Ahtna harvest technology and processing methods of resident species fish. As noted in the introduction to this report, non-salmon fish played a much more significant role in the Ahtna culture and economy before 1950 than they do today. Following World War II many Ahtna settled permanently in communities along the highway system and stopped following the old seasonal patterns which took them to lakes and streams where they could harvest non-salmon species. As a result the Ahtna no longer use many of the harvesting devices, or methods of processing described in this chapter. Today most Ahtna who fish for non-salmon species use a rod and reel, though some still use a spear to harvest whitefish in the fall. The various devices for harvesting fish used by Ahtna are summarized in Table 6.

Historically, the Ahtna used several different methods to harvest non-salmon fish, depending on the species. Whitefish, grayling, and rainbow trout, for example, migrate in streams so could be caught using weirs in combination with traps, dip nets, or gill nets (Table 6). They could also be harvested with a spear. Lake trout, on the other hand, stay in deep lakes and could only be caught using a hook and line. Burbot were most easily harvested in the winter using a jig through lake ice. Most resident species were not processed for long-term storage but rather were eaten fresh; the exceptions included whitefish and grayling. In traditional Ahtna culture humpback whitefish were singularly important because they can be harvested throughout much of the year, are very nutritious, and are available in considerable numbers (McPhail and Lindsey 1970:84). During warm weather whitefish were dried and smoked or fermented in underground caches while in the fall they were frozen in large numbers. Grayling were occasionally dried, but most people thought they were too small to store well. Burbot were caught only for the oil content of the livers.

Fish Weirs, Basket Traps and Dip Nets

Of the resident species available in Ahtna territory, humpback or lake whitefish were the most important to the traditional economy. As is true today, they were available in large quantities and very nutritious with high oil content. In the spring and fall Ahtna harvested whitefish using a weir with either a conical basket trap or dip net.

Fishing for Whitefish at Crosswind Lake, Central Ahtna Territory

In the excerpts below Fred Ewan (Ahtna Tape 135) and Frank Stickwan (2002) discuss the construction and use of fish weirs and traps. They talk about the use of these devices in relation to monitoring the harvest and minimizing waste. Traps were carefully monitored and left in the water until full. After taking 300 or 400 fish, people either stopped fishing or reduced their effort, because they did not want to catch too many fish. Frank says that traps were built and beaver dams breached so that big fish were trapped and little fish could escape. Frank points out that the intent was to harvest only big fish which, he says, is the reason "why the lake is full of fish every year. Not today, there is nothing left in there." Limiting the harvest to the number of fish that can be efficiently processed is part of the traditional management system that includes an imperative not to waste (Simeone and Kari 2002:48).

Fred describes the use of a fish weir in the outlet at the north end of Crosswind Lake. He explains that when whitefish left the lake in the spring, they were caught using a dip net or held in a weir, but in August, as the fish migrate back into the lake, they were harvested with a weir and basket traps. Fred notes that if they wanted to harvest lots of whitefish they set three traps into the weir. Weir construction began by placing a line of upright stakes across the creek. Tied to the stakes was wooden grating, and behind the grating, on the upstream side, were placed bundles of brush that stopped the fish from working their way underneath and through the weir. Several heavy logs were placed across the top of the stakes to form a bridge and to hold down the fish traps. Fishermen could walk on the logs and look into the traps from above.

K'adii łdu' plug up nats'ełiis [udahts'ehwdełtsiis]. We don't want too many you know. /Then we would just plug it up.

Frank Stickwan (2002) emphasized that people caught just enough fish for their own use and he described how fish traps were built so that small fish could escape and only the large fish would be caught

> Them little fish, they just go. And that way, make a little hole like that (in beaver dam). All the way around in there, and the little fish go out. Just big grayling is all they get. That's the way they fish. Fish trap they make a long time ago. They don't want to kill the little one, about that big around in there, so that fish (the smaller fish) go out, just the little fish. Water go right out of the fish trap. That brush all over like that trap. Just the big one. The little ones go out. We never kill them little one. Some people that's all they get. They kill them little fish. No, long time ago they don't do like that, them Native. That's why the lake is full of fish every year. Not today, there is nothing left in there.

Whitefish Weir at Tyone Lake, Western Ahtna Territory

According to Ahtna elder Jimmy Secondchief (Irving 1957:39), who lived at Tyone Lake up until the mid 1940s, the annual cycle at Tyone Lake was divided into two phases, depending upon the availability of fish. From midsummer through December, the principal activity was fishing. People gathered at locations suitable for using "V" shaped weirs and basket traps. They fished until midwinter, when shallow places in the lake would freeze to the bottom so that fishing would no longer be productive.

Reckord (1983a:33-34) describes two very large fish traps at Tyone Lake:

> ....perhaps 8 by 4 by 2 feet--set facing in opposite directions at a narrow stream-like place between two main bodies of water. As fish swam back and forth, they eventually were caught in one of the traps. Lingcod, grayling, lake trout and whitefish caught in this manner were dried in the summer and frozen in the fall. One informant estimated that a cube of fish 8 feet on each side was taken each year at Tyone Lake, and it provided much of the food for the Tyone Lake village located near this fish trap.

'Uygguh tetl'aagha delaeni uk'e k'e'i'ilkayi yii tez'aani yii tetl'aa ni'sdetiis.
/Down below on the bottom we put the fish trap on the bottom over the hewn green spruce.

Yii k'et 'unaane tcen nadini'aayi.
/Upon this a log went across.

Ts'abaeli ggaay hwtsicdze' t'ae' łetnelt'ots.
/Small spruce were jammed across (partially blocking the stream).

Duhwk'e duhwk'e duu unu' hwdełcaax xu c'a xona.
/The spaces (between the spruce) were about this far apart (about 1"-2").

'Unaane łke łketsinitsaet den.
/He pounded these (stakes) in across the stream.

Gaa xona gaa tabaaghe utl'aa 'eł delaeni duu tabaaghe nae' dini'aa.
/Here on the rear shore (of the stream) a green tree extended in the upstream direction.

Yii k'et, yii ghae ik'eghidaetl' xu tez'aani łu ik'eze duu sughiłcaax.
/On this he put down in there (logs) along side the fish trap that were about this long (6 or 7 feet).

Yii 'utggu tetl'aa gge' dae' binaltset dze' ya dadaasts'en ba hwnintsi'neltsaet.
/These were put above the bottom there, and this was pounded in on the downstream side (to form a log bin)

Yii det'aa igge' 'eli ic'a' uts'itays'aage.
/The fish would not be able to get out from beneath this (log wall).

Yełu' yii c'a t'el'aeni yii k'edyaak yak'a kiigha tsiteł'aax cu dae' tkiił'iis
/When they had this in place here, they would keep waiting there, with it fixed like that

Naxełnilggot.
/It got dark.

'Uyggu tet l'aa 'eł dghelkayi naxdinił'aayi yii kae nexxdghedaax cu dae' dghit'e'.
/With the hewed wood they had extending across down on the bottom, they sat watching the place.

Tetl'aa delaeni lkayi 'unii cu utet'uuts'c'diłdaetl'i,
/Something black (fish) upstream would pass by on the hewed green saplings on the bottom. [The saplings were placed on the bottom to reflect light.]

Utet'uuts'c'ełdiił hwna xona k'edze' iyits'enatadełi k'ekultsiis hwna łu' tgge' yułyiił c'a kekiiłtses.
/When some black objects passed by, and it appeared that they had come back inside (the trap), he would grab it and pull it out (the trap).

Hwtsicdze' xona ba' keghaax dze' 'utggu rack hwtsicdze' gha dadghilyaes.
/They were all making dry fish and everything was hung up in the rack.

Xona yet cu xona naał 'sdel'iix.
/Then finally we would sleep.

Jennie and Henry Peters (Betts 1985:16), who had lived at Valdez Creek in the upper Susitna drainage, said that in the summer they used a V shaped weir leading to a basket trap that was made out of willows which were lightly woven so the trap would not hold water, only fish. Jennie said that she never had salmon to eat when she was young because the Ahtna living at Valdez Creek did not trade with the Copper River Ahtna for salmon. She recollected cutting whitefish all day, scaling, slicing, drying and sometimes smoking them. In the winter, basket traps were placed under the ice on lakes. When the traps were full they were hoisted up with a rope and hook. Henry said that when the baskets were pulled to the surface hundreds of trout, burbot, whitefish, and grayling would sometimes be dumped out on the ice.

Whitefish Weir at Mentasta Creek, Upper Ahtna Territory

Katie John (Ahtna Tape 111) describes the ***k'edze*** or weir used to catch whitefish coming out of Mentasta Lake. She says that the weir was situated above the fast water coming from the lake and angled so that the fish were deflected into a dip net wedged into the opening of the weir (Plate 3-1). The dip net was operated from a platform attached to the weir. Katie then goes on to compare the dip net used to catch whitefish with the dip net used to catch salmon. She states that both were woven out of spruce roots but that the whitefish net had smaller holes than the salmon dip net. She also added that the net of the whitefish dip net is now made out of twine.

'Unaat Mendaesde k'edze kughile'i gha nahwgholnigi.
/I am telling about the k'edze [whitefish weir] that used to be across from Old Mentasta Village.

K'edze yenidan' hwts'en gha yiit k'edze kukughił'aen', kaniit men ts'en tełende
/Since long ago they had the angled whitefish chute just upstream of the swift current coming from the lake.

yet ya k'edze kughile'.
/That is where the chute was.

Nankehwdilaa dze' kadaa'tah nikehwni'aa.
/They put it across there and they put a section towards the downstream.

Plate 1. A whitefish weir (***k'edze*** in Mentasta language) used by the people of Tanacross at Mansfield Village. The openings and platforms are on the extreme left and right. The rim of a dipnet can be seen in the left opening. In between dips or when platform not occupied fish continue to move through the opening in the weir. Photo taken in 1971 by Bill Simeone.

Plate 2. A whitefish weir on the upper Tanana River similar to that described by Katie John. Note the size of the whitefish dip net (***'es*** in Mentasta language) and the platform attached to the weir (called ***'es k'ae*** in the Mentasta language). Photo taken by Robert McKennan in 1930.

moose will not eat it. Ahtna elder Frank Billum (Ahtna Tape 112) provided more detailed information. He said that at "Taral, ***tay'delghael*** they put brush in creek to make a weir with a small trap, only for trout and grayling." The brush is piled up to block the creek creating a weir that is used with a little fish trap made out of poles.

Other Fishing Techniques

Box Traps

Ahtna used box traps to harvest grayling. Grayling migrate in the spring soon after the ice goes out, and in the fall about the time of the first snowfall. Ahtna harvested grayling both in the spring and fall and opportunistically throughout the rest of the year. In the fall grayling are available in large numbers but only for a very short time. J.P. Sinyon of Chistochina describes a box trap that was used to catch grayling in September (West 1973). If a creek was not too deep you could dam it up and place a "little box on top of the dam" [***uk'e da'sdlaexi***]. Below the box you placed poles slanted to form a ramp. The fish swam up the ramp trying to get over the dam but instead landed in the box. J.P. said that his father-in-law used this kind of trap at Fish Lake in September of 1927 and every day he caught 100 grayling. Fred Ewan (Ahtna Tape 135) described another method for catching grayling by opening up a beaver dam to create a sluice or chute for the box trap ***uk'e da'sdlaexi***. Fish behind the dam were caught in the water flow and flushed down stream. This was done only in the fall.

Katie John describes a similar method for catching grayling and suckers in the following passage (Ahtna Tape 111). This method was not used by Katie but described to her by her mother-in-law. Katie said that the remains of a submerged rock bridge were still visible until the last five or ten years on ***Tsabaey Na'*** just before it enters Mentasta Creek. A stone bridge, called ***ts'es kae nakultsiin***, was used to partially block a stream. An opening was left in the middle of this bridge and below the opening was placed a box trap called, in Katie John's dialect, ***uk'et dac'estlaexi*** or 'one that they swim up upon' made from carved spruce poles. As the fish came

Yii c'a nen' c'a kughiłcaaxa, k'alii badahwdest(nese).
/I have not heard of this anywhere else in the country.

Koht'aenn xu' tkut'aede k'alii hw'eł 'estnehe, k'alii badests'iil.
/The people may have done this, but I did not hear about it.

Ghat yet natsii yet yaen' xu' tkut'ae de, yet yaen' 'eł estnes.
/The one [rock dam] down there below (at Fish Creek before entering Mentasta Lake) is the only one I know of.

Gaa koht'aenn cu snaghał xu' gha nahwkolnigi, 'elii dests'iil.
/Here is the one the people told me about, I did not hear if they might use maybe springtime when fish first come out.

Probably you know they let fish get fat.

Tsabaey nalk'axde ugheldze' keyiyiixde,
/When fish get fat they like to eat them

I think that's the time they start, August. August month that's the time.

Segele iyii c'elax.
/The grayling swim into it.

Grayling and whitefish were also caught in the main stem of the Copper River. Tony Jackson of Copper Center (de Laguna 1960) said that his parents put a trap in the Copper River at ***Nic'akuni'aaden,*** a fish camp located down river from Copper Center. This technique was used only in the spring when the river was low. The trap was made out of chicken wire and had a reverse funnel opening. It was tied to wire and thrown into shallow water about 10 or 12 feet from shore in an eddy behind a rock.

Reflector Sticks

For fishing in the darkening evenings of fall and in winter the Ahtna used reflector sticks placed at the bottom of a stream so that they could see the fish passing into a trap or dipnet, or to spear fish. Earlier (pp. 61-62 above) Jake Tansy mentioned the use of reflector sticks and in the following passage Frank Stickwan (2001) describes reflector sticks [***taex na'itggeyi***] used with a fish trap set up to catch grayling.

FS: They going, they catching in creek and they throw it up all across the bridge. They make bridge all and make cross. About that big around and about that

Lake, St. Anne Lake, Mendeltna Creek, and Tyone Lake. At Tyone Lake there were five bridges built across a narrow channel and men could spear fish from each bridge (Reckord 1983a: 33-34). When spearing fish in the winter, the fisher made a hole in the ice and then covered himself with a skin or made a shelter with spruce boughs so he could see the fish. Spearing whitefish in Mentasta Creek in the fall is still popular and people from other Ahtna villages travel to Mentasta to fish. Commercially produced spears are used as well as flashlights and torches, which attract the fish (Reckord 1983a: 29).

Snares and Fishhooks

According to Jack John Justin (de Laguna 1960) fine willow snares were traditionally used to catch fish. The snare loop was floated downstream and when it hit the fish the fisherman pulled upwards. According to Jack, the fish did not back away but moveed forward into the loop. All sorts of fish could be snared but Jack said they used wire snares to catch pike. Bell Joe of Chistochina (Ahtna Tape 121) said that fish snares, ***tsabaey ggaał***, were made with fresh willow or spruce root called ***xay***. He said,

> You go out in woods you see lota fish, you make fish snare. They don't know that young people. One time tell me, "you get that fish," I went out get the brush I make the snare. "You catch that whitefish," he tell me. "You take that sucker." I just throw like that and I catch them. There's too many. Wherever he point, I get it, right in the Rufus Creek, Mabel Creek. Right by the bridge.

Jake Tansy referred to fishhooks made from safety pins, which he called ***uyii c'ehwtantez'aayi gets'*** that were used by the Cantwell people to catch grayling. In the following passage Frank Stickwan (2001) describes fishing with hooks [***ges'*** or ***łox***] in the wintertime for burbot and lake trout using a spruce shelter or ***'eł hwnax*** on the ice at St. Anne Lake. Frank had heard about this but had never seen it first hand. He noted that St. Anne Lake was regarded as one of the only reliable fishing locations during the coldest winter weather because there use to be lots of fish there.

> FS: In the winter time when lake froze, one lake up that way, the Tazlina Lake and down that ways, Saint Anne Lake they call it.
>
> Q:That's *Ts' iisi Bene'*?

Secondchief udighi'aanen yen ciisi k'ae 'udii kughił'aen'.
/The one was called [Peter] Secondchief he always had a dipnetting location.

Ciisi k'ae ts'ełk'ey ben yidadiniłen na' ciisi k'ae tiz'aani teghił'a'.
/He kept a fish trap in the water at a dipnet hole at one stream coming into a lake.

Xona ya'aadi ben 'edadiniłeni yi łu' net una' teghila'.
/On the other side where it flows into a lake he had nets in the stream water.

Net 'udii diixa' ighitl'u', diixa' ighighaan.
/He always wove nets himself; he made them on his own.

Yełu' 'unaane sometime niłdenta tsabaey tiye badideł.
/And sometimes across there lots of fish would go in to him.

'Unaane łu' whiteman łu' company dae' kudighi'a' kutah xdaghalts'e'.
/They stayed among them across the way of what they called the `whiteman company'.

Fish tiye badideł de łdu' 'unaane łkanaydghaes dze' i'eł 'unaane łu' yootket.
/When lots of fish went in it (the net/trap), he would pack them back across and across there they were purchased.

C'aan i'eł na'uket.
/And he would buy food with that.

Yeł k'edze' ye Ben Datgge' łkenaydghaes.
/And he would pack them (fish) back from `lake above' [lake west of Susitna River opposite Valdez Creek].

Ye kaey tsaeye n'eł hwtsecdze' saxaali 'eł bayc'enac'elyaes.
/And with that he would exchange for tea and other things, and sugar.

Jake also noted that the Secondchief family had a location at ***Ngge' Nazdleni Na'*** (below Butte Creek mouth on the Susitna River).

Dan Secondchief 'udii deta' 'eł k'a ghida'.
/Dan Secondchief always stayed with his father.

Xona dzaen hwna xona trapping gha 'stedeł dze', trapping gha 'stedeł dze' i'eł net yic'a 'ele' c'a 'aede c'a i'dilggese.
/We went trapping during the day, and as we were trapping he never went without a net.

Yi Dan Secondchief nadghosi 'iłcet dze' c'a ben łdu' gaa su one foot c'a su detiis.
/Dan Secondchief would take a saw, and the lake here might have frozen one foot (thick).

fish" which was fish hung up and slightly spoiled. Split whitefish, with the roe left inside, where also fermented. Both dried and fermented fish were kept through the winter in underground storage pits lined with birch bark. Ahtna had elaborate methods for covering the caches to protect the contents from spoilage, animals or people.

Katie John (2002) describes various methods for preserving whitefish in the following passage. In the fall whitefish were frozen and then covered over. These fish would last until spring. She also talks about drying whitefish in the summer using a special style of cutting called ***tsilalkay*** in which the fish is split into two parts and then hung up to dry.

> Q: Were they putting up whitefish or just eating as they go?
> Nikeyełcet.
> /They store it.
>
> Tsabaey ten xi'edił'aan
> /Frozen whitefish it is called.
>
> k'ae'i kii'iix dze' nekenakiidelaes.
> /They keep it in a pit and they bring it back out.
>
> Outside freezing xay de uka
> /They freeze it outside for the winter.
>
> Nen' ten luugge'
> /[These are] 'Frozen ground fish,' [i.e. whitefish frozen in the fall].
>
> Q: How long were they good?
>
> They good until maybe April. They just put it in the cache, and they cover up things and so they keep fresh that way all the time. If you just leave it out there hanging on a pole when it froze up, and they just put it inside. Something canvas or gunnysack or something. And they really cover it up good and they put it away for winter. Then all winter it's just fresh.
>
> Tsilalkay that, just summertime [style of cutting fish].
>
> Q: What does that word mean?
>
> That's where they cut it. That is [also] the smallest whitefish. Tsilalkay is the little small one. Just young one. That's a whole fish. That's a head. And that's the tail here and they just split it up this way.
>
> He open em up and he just hanging. They cut meat like that.
> It's not like ba'.

In your fish camp did they make łuux dzenax?
/fermented whitefish

Yeah my daddy make one time, but I don't. Around that area he put in there. That's where old village used to be.

They put it in k'ey ts'aac just for the floor, like a dry wall.
/birch basket

K'ey everything nihghilaes. Xu' łdu'.
/They put in birch bark.

Four corners and maybe one hundred or two hundred whitefish they put in there.

In wintertime they took it out. Make a soup or something. It smells, but it tastes good. They gut it, and clean it up first when they put it in.

Łuux k'uune' are good eating I tell you. We take it out right there where we cut it.
/Whitefish eggs

Full frying pan. And the head in there. Just boiling away. That way you make fish oil.

Lotsa k'uun', tsabaey bet' no dirty. łuux bet' really clean.
/Lots of roe, and whitefish bellies are not dirty, whitefish bellies are clean.

Whitefish were also fermented on the upper Copper River. Here Katie John (2002) describes in more detail the process for fermenting whitefish.

Q: re. Łuux dzenax (fermented whitefish)

That one they must use k'ey (birchbark),

k'ey yintsikele'e, k'ey ts'aac kiighaaghe.
/They put them in birch bark; into birch bark baskets that they make.

They fix k'ey ts'aac (birch bark container), about this deep. And they clean it (the fish) up inside and they put cut side (of fish) down, and this side, side down and whole piece just they open on side. They don't open too much. But that meat they open and just the air come out. And they put it in that k'ey ts'aac. They just stack it up like that. Then they put basket in the ground [in underground caches.].

k'ey ts'aac yii kiilaesi igge' 'utggat uk'et du' tsabaey du' niłdzic'et'aas dze' ba' k'et'iix.
/They put it in the birchbark baskets and stack the cut, that whitefish is cut, like flat dry fish (**ba'**).

Yii igge' delaes.
/They are covered up down below.
That's the top cover. Just like ba' they cut it open. And they just put on top.

boiled and then fried producing a "lot of clean grease." The oil was kept in bottles and taken when people were ill.

Summary

In the past the Ahtna used different methods to harvest resident species fish, depending on the type of fish and environmental conditions. Since whitefish and grayling migrate in streams they could be easily harvested using basket traps or dip nets. Whitefish could also be speared. However, a species like lake trout could only be caught with hook and line or speared through the ice in winter. At certain times of the year burbot could be harvested in streams, but they are best caught in the winter using a jig through lake ice. Fish traps and dip nets were designed to take into account the traditional view that a sustainable fishery was predicated on how people fished. To this end traps and nets were designed to let little fish escape and Frank Stickwan makes the point that by harvesting only big fish and letting the little ones escape was "why the lake is full of fish every year."

Of the resident species harvested by Ahtna most were eaten fresh and only whitefish were processed for long-term storage. Grayling were occasionally dried, but do not store well. Burbot were caught for their eggs and livers, called ***ts'anyae zet'***, and rendered for the oil. Fred Ewan said that people did not eat burbot meat, which was fed to the dogs. Large quantities of suckers were harvested and used mainly as dog food, but humans also ate them. In the spring and summer whitefish were dried or fermented, and in the fall they were frozen. During the spring and summer the aim was to catch fish that were fat and large enough to be successfully processed and stored. To produce a good product the Ahtna targeted male rather than female whitefish because when females have eggs they are not as fat as males.

Chapter Five
Ahtna Oral Traditions Related to Resident Species Fish

Introduction

In Chapter Two of this report we briefly described how the story of ***Bac'its'aadi*** was an assertion about the relatedness of humans and salmon (and by extension all animals) based on the idea of a shared "personhood" (Langdon 2003:2). The narratives presented in this chapter reflect that relational view of nature. For example, the story about the anatomy of the longnose sucker can be understood as an allegory of the interrelatedness of all things, since the sucker fish possesses not only the lost horns of the female moose but the fluted handled knife of the humans. The stories about the giant fish demonstrate this relatedness, but they also show that animals are powerful beings that if provoked can be dangerous and destructive. To avoid provoking the anger of these powerful beings the Ahtna followed a myriad of taboos and avoidances.

In this chapter we discuss several taboos and avoidances for people to follow regarding non-salmon fish and present several oral traditions that refer to these fish. In the Ahtna language there is a concept called **c'uniis** (Kari 1990: 308; Simeone and Kari 2002:45-46), which is an illness caused by mishandling animals as they are harvested. The word **c'uniis** means 'an animal spirit that can cause sickness' and is literally translated as 'it takes something.' The animals that can cause this illness are moose, brown bear, black bear, wolverine, lynx, and the other furbearers, but not fish. Salmon could cause another kind of sickness that was avoided through a ritual cleansing by humans immediately after they had caught the first salmon of the season (Simeone and Kari 2002: 45-46; 49).

In terms of everyday Ahtna beliefs, and the topics represented in Ahtna oral tradition, the animals of the natural world seem to be categorized into two groups. The most prominent role in Ahtna ***yenida'a*** (or legendary) stories is given to the animals such as raven, bear, wolverine, and

Table 7. Lakes that have Giant Fish in the Ahtna Oral Tradition

Ahtna Name	*Location*	*Literal Translation*	*Source*	*Species*
Western Ahtna				
Hwtsuughe Ben Ce'e	Tyone Lake	"toward the water big lake"	Andy Tyone	lake trout
Sasnuu Bene'	Lake Louise	"sand Island Lake"	Andy Tyone, Fred Ewan	lake trout
Hwniindi Kacaagh Bene'	Deadman Lake	"upriver - large area - lake'	Jake Tansy	
Hwdaandi Kacaagh Bene'	Big Lake	downriver- large area - lake"	Jake Tansy	
Nts'ezi Bene'	Tsusena Lake	"protruding hill lake"	Jake Tansy	lake trout
Central Ahtna				
Tl'atibene'	Klutina Lake	"headwaters lake" .	Jim McKinley	
C'obeni, C'abeni	Middle Lake	"off-lake"	Fred Ewan	lake trout
Nahwtl'iidze' Bene'	Deep Lake	"blue lake"	Fred Ewan	
C'abeni	lake N of Crosswind L	"off lake"	Fred Ewan	
Ben Ges	Lake S of Dog Lake	"nostril lake"	Fred Ewan	botfly
Łike' Bene'	Dog Lake	"dogs' lake"	Fred Ewan	sucker
Kaghalk'edi Bene'	Crosswind Lake	?	Fred Ewan, Frank Stickwan	lake trout
Łiidzi Bene'	Ewan Lake	"soil lake"	Fred Ewan, Frank Stickwan	burbot
Bendilbene'	Tazlina Lake	"lake current lake"	Jim McKinley, Mary Risley	burbot
Lower Ahtna				
Tsabaey Bene'	Town Lake			
Kentsii Bene'	Tonsina Lake	"spruce-bark-canoe lake"	Jim McKinley	lake trout
Tl'atna' Bene'	lake on upper fork of Dust Creek	"headwaters stream lake"	Bob Marshall	
Upper Ahtna				
Dzah Nii Menn'	Copper Lake, "Billy Lake"	"rarely-said lake"	Katie John	lake trout
Tanaadi Menn'	Tanada Lake	"moving-water lake"	Katie John	lake trout

And Crosswind Lake is trout, **baet**. Tazlina Lake I think **ts'anyae** too. **Ben yiidi** all right. Big they say. **Łike' Na'**, [Dog Creek]. My uncle he see. He says. **'un'e** the whole length lake pretty near, just like a **dlaa leł** [floating algae]. Floating algae you know, **un'e kankeltsuuk dze' yaen' xut'ae.** [upstream the algae pushed up]. He just watch, pretty soon **'eł unakudlaele** [it disappeared]. Too hot upstream **dze' u'eł nic'uuk dze' ben** [and the lake warmed up with it]. Pretty near bigger than the lake they say.

At Crosswind Lake they say, there was a big trout they say. In there. But he [the fish] went down. This white guy had to row. Boy pretty soon he got caught in that whirlpool water you know. And boy he try to get out. Pretty hard to get out he say. But some more Indian story there. A family of caribou went across, about ten of them. They say right in the middle it went like a whale. Only one calf come out. Summertime. **Ben yiidi** is this wide. He open his mouth everything water come down. Like a whale. That's the only way he can catch like a caribou. He get it that way. Only caribou I heard about like that. Tony Jackson, Nick Jackson he see. At Crosswind Lake he stay. And next morning they left for Copper Center. Right in the middle of the lake he see not **ben yiidi**, but trout. **'ele' sesde c'a den'iłcaaghe**. [It was huge]. **'Utggahdze' ten edeł**, dog team. [He was going above on the ice with a dog team]. He ride. He want to get him. He fly right down. Someone see Indian **Bes Cene ts'en, tacene** you [from Liebestag village]. Someone saw him from **Tacene** [bay on Crosswind L) you know. **'Utggu tail usts'en kennel'aa.** [The tail was extending off.]

So 60 feet, 30 feet they say. You know sunshine 'use [out there] the tail sticking out was 60 feet or 30 feet sticking out with sun shining on it. **Kennel'aa** [it stuck out]. They never go **ben baaghe 'ele' stedeli** old timer, bad **ku'utanesi gha** something. [They never went far from the lake shore, the old timers, something might get them]. They real smart with it I hear.

Ben Ges iygge katikudaan xu tkut'ae you know **'uyggu**. [that 'nostril lake' [lake S of Dog Lake] is deep, down there it hide there. Some whiteman say fish **'utnes dae' kenii ghayet**. Net kae. [A white man said he got a fish there, with a net.]

Lower Copper River, Lower Ahtna Territory

Robert earlier noted that Chitina Lake had a giant fish. Bob heard from Joe Goodlataw that in 1914 three oil tanks fell into lake during a landslide. The lake was all covered with oil. The Ahtna say that this killed the giant fish in Chitina Lake. The fish was in the lake at the time.

Upper Copper River, Upper Ahtna Territory

Katie John (2002) discussed giant fish in Tanada Lake. This particular story has interesting details, such as the violent movement of the water and lightning that may signify a volcanic eruption of Mt. Wrangell.

> Q: What about Tanada Lake?
>
> KJ: Lots grayling and trout and ling cod. Some time they're big ones [ling cod]. Half way [the lake is] not too deep, 4, 5, 6, 7 feet deep. But other way that's a way back story, that's a really deep. Some people wintertime, they put hook down. And somebody put rock in there. And it never touch bottom he say. Long time ago people had different story. I don't think anybody know that. Where deepest place there are biggest fish in there. Where salmon coming, I hear there big salmon there. And grayling, ling cod, lake trout, all those big ones.
>
> One time come out Banzaneta Lake [Tanada Lake] that big fish. Big fish come out. When he come out his head down to the creek and they can't catch fish. So smart. They had dip net. He coming, turn around and go back. His head coming this way, that big head. And some man fishing all night, they are hungry and fish coming down and turn around and go back. He got mad and he start a cuss that fish. And you know **'engii** [forbidden] everything we say. If we get mad that's a bad luck. **Baet** [lake trout] was there. And probably ling cod. I never hear about big [giant] grayling. And next day that lake starta move. Water just start moving and head way up hillside, and they all run. They got hill that

Upper Susitna River, Western Ahtna Territory

In March of 1983 Jake Tansy recorded two giant fish stories.[2] Both have to do with a giant fish in ***Nts'ezi Bene'*** or Tsusena Lake on the north side of the Susitna River. As noted above Ahtna people consider stories that take place at specific places as true or nonfiction. Jake has a sense of the relative historicity of the two incidents related in these stories, and he tells this with his distinctive flair for detail and suspense. For contrast we present a **yenida'a** story about burbot and lake trout that takes place in the legendary past.

Nts'ezi Bene' Ben 'Eltaeni, The Creature in Tsusena Lake

This story was told by Jake Tansy and recorded by James Kari 1983 (Ahtna Tape 40) and reviewed with Jane Nicholas, April 2002

First incident at ***Nts'zi Bene'***

> Tihda'a tah koht'aene deghedze' kae łuxałhnilaa.
> /Long ago the people used to pull sleds with their shoulders.
>
> Yet Kacaagh idadiniłeni 'utsiit ts'abael tah diniłende dadaadze ts'en,
> Nts'ezi Bene' udi'aani.
> /There at 'wide area' [Deadman Lake], where current flows out to the lowland among spruce, where the current flows from the downstream side is 'Nts'ezi lake' [Tsusena Lake].
>
> Ben bey' bec'eltaeni łu kii'eł ts'etniigi dze'.
> /They did not know that there was a living creature in that lake.
>
> Niłkudaghalzet 'udaa' kiixałdilaa.
> /Equi-distant [between the lakes] and downstream they pulled the sleds.
>
> 'Udaa' k'a k'es, 'udaa' k'a k'es kiik'e taxałtezdlaa 'eł.
> /Downstream at the outlet they started to bring the sleds downstream at the outlet out on it (the lake ice).

---

[2] Jake Tansy told one of these stories in 1985 to archaeologist Robert Betts. "While at the site [at Butte Lake] Jake told us a long story which was related to him by Jimmy Secondchief, his cousin, about a giant fish that lived in one of the lakes in the region. The fish ate a woman and her baby who had stopped beside the lakeshore while the other band members had moved on. They crying of the baby disturbed the fish, which came to the surface and then up on land and ate the two people. The band waited awhile and then went back looking for the woman and her baby. They say something had come up out of the water at the place where they had stopped. Jake was taught as a child to be very quiet when in the vicinity of this lake for fear of disturbing this giant fish" (Betts 1985).

The second incident at ***Nts'ezi Bene'***

Then after that c'a su li'i c'a hwk'edze' c'a su
/So after that, much later, at another time

sii ts'iłghan łu c'e'aaxe natedaas.
/one guy was going outdoors (hunting).

Saen tah ghanaay ka natedaas.
/He was going for caribou during the summer.

Su yet ts'en datsii dats'en hwngilaayi k'aa daghayaaɬi.
/From there on the downland side he was coming down a series of hills.

'Unaa yanaasts'en gaahwts'e taak'i dił'aeyi gheyaał.
/Across from the other side, here three bull caribou were walking.

Xuk'a inał'aende xu c'a tał'asi de yutnii.
/He kept looking at them to see where they would move.

Yidi 'eł 'unaa ben baaghe ts'inił'aats' 'eł
/Across the lake they [caribou] came out to the lake shore and

niłkudaghalzetde c'a ben niłdaghalcaaxde 'unaats'e yetaghił'aa.
/halfway along the distance of the lake there is an arm (of the lake) extending across the way.

'Unaats'e nic'a'il'aetl' ghanc'a 'usoghe natedaas uhwts'e.
/They were swimming from across there, and he was going out there on the peninsula.

Yehwna cu k'a hwnene idacaex c'etnel'iin.
/He was sneaking to intercept them on the hillside.

K'a xona k'a niłkudaghalzet de ni'il'aetl'i
/Then halfway across just then they stopped swimming.

Nasendze' c'a ide' u'eł nic'a'o'tezyaayi c'a,
/Out in the distance bubbles started whirling around their antlers.

'Usu de' ye' 'utggu nic'ehwtxatas, nic'ehwtatas.
/Out there their antlers were spinning about on the surface, they were spinning around.

All taak'i nlaen ts'e de' uk'e u'eł ta'otnii.
/All three of them were pulled into the water in a whirlpool.

Naa! Yidi c'a c'ul'aetl'. Yii daaghe su k'ał'ax.
/What! Nothing was swimming there! For some reason this is true.

Xu' uk'enaey łdu' every night gha uk'enaey tets tah 'udii 'utsii ben baaghe hdelts'iit nił tanahdelghaas.
/Her siblings were always making noise every night down below on the lake shore where they were staying.

K'e xodze' 'eł xodze' iit, ta xełts'e' tah xona nakudlaex dze' c'a hdelghuus, hdelghuus.
/Then every evening this would happen again, they would make noise and make noise.

Xona dae' saggan łde' dadezghaetł'.
/In the morning it was quiet.

Cu xu'k'a cu nahnesdaał, cu xu'k'a k'a eli' yidi c'a dits'iige.
/And another night passed, and she didn't hear anything else.

Dae' dadighaetl' dze' c'a.
/Then it got quiet.

"Nts'et kut'e'dze' da?" nizen dze'?
/She thought, "What is going on?"

'Utsiit hwt'ae' tesde kanadyaa.
/She went up the hill in the lowland.

'Utsiit c'a hwnax, beletga' 'eł, kenc'ughełniic.
/Down below where there was a shelter, a tent had been pitched.

Yidi c'a 'eli' ditniige dae' hwtsicdze' hwtazyaa.
/But there was nothing there, everything had washed out with high water.

'Utsii yahwdedyaayi 'eł nothing, dae' yidi c'a 'eli' ditniiye.
/She went down below, but somehow nothing was the same.

C'a ben 'ae ghayet ben 'ehdelyaayi,
/And things that had been there in the lake,

Ben 'eltaeni yii xu kugha tabaaghe kezdlaex de.
/A creature [a giant fish] in the lake had swam to them at the shore.

Hwtsicdze' yii kutełna'.
/It had swallowed up everything.

Beletga' ts'iłde yii si cu ts'es tsicdze' ts'es nił nadghilaes de.
/By the tent on one side she gathered together all kinds of rocks.

Ts'es t'ae'dze' hwtsicdze' nitninił t'ots.
/She piled up all the rocks.

Łu t'aedze' gheli tsets tcen tiye tsi'nelt'aeyi nadelyaa.
/She gathered a whole lot of good dry wood and logs

Tsedi i'lagets' yidi tsedi lagets' yidelniic.
/Copper gloves, she put on copper gloves.

Du si gaa ts'es siit' k'ent'aeyi yiłyetl' izaa dze' say'deł'aa.
/Here she grabbed some of those red-hot rocks and she put them in its mouth.

Yii dixa'a c'a uzaa łts'idiłdaeł.
/The wind blew those rocks into its mouth.

Xona half c'eghaan' dze' cu ts'es hwtsicdze' izaadghilaay.
/Half of them went into its mouth.

'Eł cisnatse dae' datsene u'eł niłkenahwdestniic
/And all of a sudden down by the shore was a noise that moved in a circle.

Ht'ae' nadadidghaetl'.
/It got very quiet again.

'Eli c'a dahwdist'aege cu coxe nahw ben 'ae nadahwdestnes
/Not much later there was another noise in the lake.

Yidi 'eł cu coxe xodze' yehwna cu xodze' gha tsoxe gha nts'e dghat'aen' xu.
/The same thing again happened, just like it had happened the first time.
Another fish came to the surface and opened its mouth.

Xu su ts'es 'use' łyetl' di uzaa ye dzaxts'e' say'deł'aa hwna
/She grabbed some of those rocks from the fire and she put lots of them in its mouth.

Xodze' dixak'a uzaa łts'idełdaetl'.
/The wind carried those rocks right into its mouth.

Xodze' c'a k'adii ndahwk'e ts'es c'a izaa dghilaa,
/So many rocks had gone into its mouth,

xuk'e ts'es izaa dghilaayi cu yii cu datsene 'eł niłkenahwdestnii.
/as the rocks were leaving in its mouth, down below (at the lake) there was a noise that moved in a circle.

Dadighaetl' tets
/It got calm at night.

Saggan kakal'aeni 'eł 'utsene ben dze' ni\ghatsene nadaeggi nts'e c'a tes hwnez'aani k'ent'ae
/In the morning it got daylight and down at the lake there was something that looked like two hills.

Uzaegge' kenc'utnghelts'etl'
/Their [two giant fish] throats had been scorched.

Yii daaghe ba dii ling cod uzet' good, cod liver oil 'eł c'a nlaen.
/And this is the reason why the lingcod's liver is good, it is like cod liver oil.

C'a cod liver oil gaa ling cod zet' uzet' dghalnes c'a udetnii ling cod.
/So the ling cold liver tastes like cod liver oil, it is said of the ling cod.

Yii izet' ghiyaan'i yii daaghe uzet' ugheli c'ilaen.
/She ate that liver and due to this its liver is good.

The Longnose Sucker

The longnose sucker (*Castomos castomos*) has some importance to the Ahtna as a reliable secondary food source. They occur in large numbers in many small streams throughout Ahtna territory and are easily caught in fish traps and box traps. In November of 2000 Jake Tansy told this story about the sucker's elaborate bone structure. Stories about the bones of the sucker are told in other Northern Athabascan languages, such as Koyukon and Dena'ina, and in other North America Indian languages. For example, Hunn (1980:155-158) mentions a similar Sahaptin story about the sucker. This is another example of a ***Yenida'a*** story that takes place in the legendary past when people and animals could speak to one another.

This story was told by Jake Tansy in 2000 and recorded by James Kari (Ahtna Tape 106).

Tsabaey k'a nlaen xu, tsabaey k'a nlaen xu su.
/There are fish, and there are [various] fish.

Yenida'a koht'aene yedi c'a xu hwlakołdeł.
/Long ago people would give things away.

No, k'ali'i nle' natdzałgheli, hwt'ae' 'itaałceł," kenii.
/"I won't give that back to you, I will just keep it," they would say.

Xuc'a ut'e' one ts'ełk'ey łuk'ece'e ts'enyae c'a su yidi c'a dghine'de.
/There is one [fish], a king salmon or a ling cod that said this.

Yii si gaa k'adii c'a yeden hwniyaldeł, 'eli' koht'aene 'ele' k'edze' 'eli'i nayiłdeli.
/That one that time he took some things, and he did not return them to the people.

Koht'aene 'iiye yiłcetdze'.

Niłdzaats'aghi, gaa łyeda'a uyiyiłtaan.
/He has a coiled handled knife inside there.

Deyaazi de' gaa c'a uyi yiz'aan.
/A cow moose's horns are in there.

Yi gha su deyaazi c'a ude' kole.
/That is why the cow moose has no horns.

C'eyiidze' łu udae' c'ilaen.
/The bull moose has the horns.

K'adii ndaane c'a dahts'adyeh tse' nghuł'aen'i xu,
/Now whenever you see the sucker's head,

k'ał'aa c'a tkonii de.
/it is true what is said.

Dahts'adyeh tse' c'a gaani 'use naz'aay' 'etadghitset dze' tnełghots.
/When you put the sucker head in water a pot on the fire and it boils.

C'etiye dghiłcaaxi dahts'adyeh duu ghiłcaax.
/It should be a big one, a sucker of this size.

Dghiłtsigi łu hard to see you know.
/Small ones are hard to see (the bones) you know.

Utse' ts'ezdlaets xu tnełghots xu, tiye stlo', utsen' uts'edax xu
/We cook its head, and it is boiled and it gets soft and the meat comes off of it.

Uts'ene' yen uyits'exiighadax.
/Its bones from its insides are exposed.

Deyaazi de' utsits'ene' gaa uyits'es'dini'aan.
/The cow moose's horns are here like a stone placed in its skull.

T'ae gheli k'ali' deyaazi k'adii gha c'eyiidze' dae' yii nts'e nt'ae xu c'a
/Now really it is so, the cow moose used to have horns like the bull moose's horns.

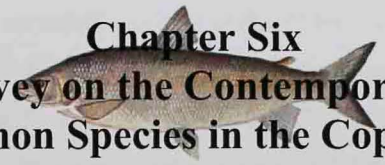
You believe it, you know.

Utse' gaa hwk'e łtset, dze' uts'itighit'aats' dze' 'uset naz'aayi 'etghilaets dae' stlo' 'eł.
/Its head is sliced and cut open out there it is put in boiling kettle and it gets soft.

Uts'ene utats'i'ilaes dze'
/Its bones come off of it.

violent nature. As such, the stories demonstrate how precarious the relationship between humans and nature is. To maintain this relationship humans followed a series of rules that included respecting the fish, minimizing waste (i.e. not over harvesting) and maintaining a clean environment (Simeone 2002:49-50; 77-78). In addition children were expected to remain quiet and not make disturbance when around the harvest site (ibid). If left undisturbed giant fish remained tranquil, but when needlessly disturbed by humans became incredibly dangerous. At the same time the giant fish could also be viewed as symbols of nature in its purest, undisturbed state. Both Bob Marshall and Katie John remark that the giant fish are now gone. Bob says the giant fish at Chitina was destroyed by oil pollution. Katie wonders why, with all the noise from machines on Tanada Lake, that the giant fish have not appeared, and she speculated that they might have been offended and gone some place else.

Chapter Six
Results of a Survey on the Contemporary Harvest and Use of Non-Salmon Species in the Copper River Basin



Introduction

The objective of the survey was to update data on the harvest and use of resident species of fish collected by the Division of Subsistence in 1982 and 1988. This included identifying species harvested, estimating harvest quantities, assessing levels of harvest effort, collecting harvest location data, collecting data on harvest methods and methods of preparation, and assessing how the harvest of resident species fits into contemporary subsistence patterns.

A standardized harvest survey was used to collect harvest and use data on non-salmon fish species (Appendix A). Survey data are presented in a series of tables in the body of the report. Additional tables representing data for each community can be found in Appendix B. Respondents were asked to recall their harvest of non-salmon species for a one year period from October 1, 2000 to September 30, 2001. The survey included questions on the quantities of fish harvested and used, types of fishing gear, methods of transportation to fishing sites, sharing practices, and household size and composition. Of the 1,193 households in the Basin, 42 percent, or 496 households, were interviewed, which compares favorably with the target in the investigation plan and co-incidentally is about the same percentage (472 households or 38 percent) of households interviewed in 1988 (McMillan and Cuccarese 1988:9-10).

Methodology

The study was conducted in cooperation with the Copper River Native Association (CRNA), Cheesh'Na Tribal Council, Mentasta Tribal Council, and the Chitina Tribal Council. With

Table 8. Sample Copper Basin Communities and Estimated Populations
Copper River Basin Communities, 2001

Community	U.S. Census Estimated community population	ADF&G Estimated community population
Copper River Basin	2,926	3,094
Chistochina	93	78
Chitina	123	95
Copper Center/Silver Springs	492	557
Gakona	215	251
Glennallen	554	572
Gulkana	88	63
Kenny Lake	410	280
Lake Louise	88	86
McCarthy/McCarthy Road	42	117
Mendeltna	63	38
Mentasta	142	147
Nelchina	71	86
Paxson	43	38
Slana	124	122
Tazlina/Copperville	328	298
Tolsona	27	31
Tonsina	92	71
Willow Creek	201	167

SOURCES: Alaska Dept. of Community and Economic Development, AK. Community Database
Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 2002

interviewing all households in communities with 80 or less households. In larger communities the goal was to interview 20 percent of the households selected from a random sample. This procedure was used in a majority of the communities, including Glennallen. However CRNA staff said they were not comfortable interviewing non-Natives, and additionally CRNA wanted to interview 100 percent of Native households. To accommodate CRNA, the project investigator devised an alternative procedure for the four villages served by CRNA in the Copper Basin: Gakona, Gulkana, Tazlina/Copperville, and Copper Center. These communities were separated into two strata, one composed of Native and another of non-Native households. The objective was to interview 100 percent of the Native population and a random sample of the non-Native population. In reporting the data we have combined the Native and non-Native samples, treating each as a separate stratum.

In the investigation plan approved by the Fisheries Information Service it was estimated that 927 households resided in the Copper River Basin, but the final count was 1,193 households, 28 percent more than originally estimated. As noted above, the goal was to interview 100 percent of households in the small Native communities and to develop a sample for the larger communities for a total of 685 interviews. Four hundred and ninety six households were interviewed and sampling goals were achieved in Glennallen, Tolsona, Tazlina/Copperville, and Willow Creek. The refusal rate was low but winter weather and the distances between communities made it very difficult to contact people, thus reducing the overall contact and interview rate. Local assistants administered the survey in person. Each person contacted was informed that his or her participation in the survey was voluntary and that his or her identity would remain confidential. A household not contacted after three attempts was dropped and another was randomly selected and added to the sample.

According to the schedule in the investigation plan, preparations for the survey were to begin in September 2001 and the survey was to be completed by the end of November 2001. However preparations for the survey did not begin until mid-October 2001 and the last surveys were not completed until May of 2002. The Mentasta Tribal Council hired one person to conduct the surveys. This person quickly surveyed Mentasta Village, but because of transportation problems, she had difficulty surveying houses along the Tok Cutoff or Nabesna Road. Cheesh

Table 10. Percentage of Households Harvesting and Using Non-salmon Fish by Species, Copper Basin Communities, 2001

	Chistochina		Chitina		Copper Center		Gakona		Glennallen		Gulkana		Kenny Lake		Lake Louise		Mc/McCarthy Rd.	
	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use
Burbot	10.0%	10.0%	0.0%	0.0%	13.1%	15.4%	20.3%	20.3%	11.3%	12.9%	9.1%	18.2%	9.1%	18.2%	54.5%	63.6%	0.0%	0.0%
Dolly Varden	3.3%	6.7%	25.0%	37.5%	18.5%	19.7%	16.3%	16.3%	6.5%	6.5%	0.0%	0.0%	40.9%	40.9%	0.0%	0.0%	26.9%	26.9%
Lake Trout	20.0%	20.0%	18.8%	18.8%	16.6%	20.8%	12.2%	16.3%	12.9%	14.5%	0.0%	0.0%	4.5%	4.5%	54.5%	63.6%	15.4%	15.4%
Grayling	43.3%	43.3%	12.5%	18.8%	33.0%	35.4%	48.8%	48.8%	22.6%	22.6%	36.4%	45.5%	27.3%	31.8%	27.3%	27.3%	15.4%	15.4%
Pike	3.3%	3.3%	0.0%	0.0%	1.2%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.1%	9.1%	3.8%	3.8%
Sucker	0.0%	0.0%	0.0%	0.0%	1.2%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.7%	7.7%
Rainbow Trout	0.0%	0.0%	25.0%	31.3%	29.7%	29.7%	16.3%	16.3%	16.1%	17.7%	18.2%	18.2%	45.5%	45.5%	18.2%	18.2%	26.9%	30.8%
Steelhead	0.0%	0.0%	6.3%	6.3%	1.9%	3.1%	0.0%	0.0%	0.0%	0.0%	9.1%	9.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Whitefish	13.3%	20.0%	0.0%	0.0%	13.6%	17.1%	9.3%	9.3%	4.8%	4.8%	0.0%	0.0%	0.0%	0.0%	54.5%	72.7%	0.0%	0.0%

	Mendeltna		Mentasta		Nelchina		Paxson		Slana		Tazlina		Tonsina		Tolsona		Willow Creek	
	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use	Harvest	Use
Burbot	22.2%	33.3%	3.1%	3.1%	0.0%	0.0%	10.0%	10.0%	40.0%	44.0%	11.0%	13.2%	7.7%	11.5%	6.7%	20.0%	8.3%	8.3%
Dolly Varden	0.0%	0.0%	6.3%	6.3%	16.7%	16.7%	40.0%	40.0%	32.0%	32.0%	13.2%	14.8%	30.8%	30.8%	0.0%	0.0%	33.3%	33.3%
Lake Trout	22.2%	33.3%	6.3%	6.3%	16.7%	16.7%	30.0%	40.0%	44.0%	44.0%	11.0%	11.9%	3.8%	3.8%	6.7%	13.3%	0.0%	4.2%
Grayling	11.1%	11.1%	46.9%	43.8%	44.4%	38.9%	40.0%	40.0%	76.0%	84.0%	29.3%	30.1%	26.9%	26.9%	20.0%	20.0%	25.0%	25.0%
Pike	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.0%	12.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sucker	0.0%	11.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rainbow Trout	22.2%	33.3%	0.0%	0.0%	50.0%	50.0%	10.0%	20.0%	4.0%	4.0%	8.9%	11.9%	38.5%	38.5%	26.7%	26.7%	37.5%	37.5%
Steelhead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%	5.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Whitefish	0.0%	0.0%	62.5%	53.1%	0.0%	0.0%	20.0%	20.0%	32.0%	32.0%	6.4%	7.2%	3.8%	3.8%	0.0%	0.0%	0.0%	0.0%

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 2002

Table 11. Total Pounds Harvested by Non-salmon Fish Species, Copper Basin Communities, 2001

Community	Burbot	Arctic Char	Dolly Varden	Lake Trout	Grayling	Pike	Sucker	Rainbow Trout	Steelhead	Unknown Trout	Whitefish	Total
Chistochina	168.7	0.0	2.2	167.7	129.5	6.9	0.0	0.0	0.0	0.0	58.8	533.8
Chitina	0.0	0.0	41.6	60.1	48.6	0.0	0.0	80.9	9.7	0.0	0.0	240.9
Copper Center/SilverSprings	374.9	27.9	235.2	256.1	563.7	5.9	29.4	1177.6	97.7	0.0	488.6	3257.0
Gakona	319.8	0.0	126.0	129.8	349.1	0.0	0.0	133.9	0.0	0.0	980.3	2038.9
Glennallen	189.5	0.0	299.1	177.7	340.9	0.0	0.0	488.3	0.0	0.0	142.1	1637.6
Gulkana	108.0	0.0	0.0	0.0	252.0	0.0	0.0	58.8	12.6	0.0	0.0	431.4
Kenny Lake	46.8	0.0	392.0	26.0	286.7	0.0	0.0	664.3	0.0	0.0	0.0	1415.8
Lake Louise	500.9	0.0	0.0	126.7	161.7	20.8	0.0	36.5	0.0	0.0	1891.9	2738.5
McCarthy/McCarthy Road	0.0	0.0	60.5	113.2	17.3	5.0	5.0	161.0	0.0	17.0	0.0	379.0
Mendeltna	55.2	0.0	0.0	51.1	21.5	0.0	0.0	32.2	0.0	0.0	0.0	160.0
Mentasta	4.1	0.0	10.6	13.3	327.2	0.0	0.0	0.0	0.0	0.0	612.1	967.3
Nelchina	0.0	0.0	25.6	120.0	115.5	0.0	0.0	264.6	0.0	0.0	0.0	525.7
Paxson	40.3	0.0	47.3	33.6	92.6	0.0	0.0	5.9	0.0	0.0	20.8	240.5
Slana	482.1	0.0	229.9	386.9	661.4	194.4	17.4	3.5	0.0	19.8	203.1	2198.5
Tazlina/Copperville	508.3	0.0	220.9	196.6	237.8	0.0	0.0	396.8	25.7	0.0	170.4	1756.5
Tolsona	9.6	0.0	0.0	6.0	11.2	0.0	0.0	57.4	0.0	0.0	0.0	84.2
Tonsina	12.6	0.0	105.9	20.9	45.8	0.0	0.0	164.8	0.0	0.0	2.4	352.4
Willow Creek	32.0	0.0	111.0	0.0	95.7	0.0	0.0	233.3	0.0	0.0	0.0	472.0
Total Pounds	2852.8	27.9	1907.8	1885.7	3758.2	233.0	51.8	3959.8	145.7	36.8	4570.5	

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 2002

Table 12. Harvest in Pounds, Non-salmon Fishery, Copper Basin Communities, 2001

	per capita harvest lbs/non-salmon	mean hh lbs/non-salmon	total harvest lbs/non-salmon
Chistochina	6.7	14.4	533.9
Chitina	2.5	6.5	240.9
Copper Center	5.8	18.3	3256.8
Gakona	8.1	24.2	2039.1
Glennallen	2.8	8.0	1637.5
Gulkana	6.8	13.0	431.4
Kenny Lake	5.0	9.9	1415.7
Lake Louise	31.9	66.8	2728.8
McCarthy/ Mc. Road	3.2	8.0	378.9
Mendeltna	4.1	6.9	159.9
Mentasta	6.5	17.9	967.4
Nelchina	19.4	6.1	525.7
Paxson/Sourdough	6.3	11.4	240.4
Slana	18.0	35.4	2198.5
Tazlina	5.8	14.6	1756.5
Tolsona	2.7	5.6	84.2
Tonsina	4.9	10.3	352.2
Willow Creek	2.8	5.9	472

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 2002

set hooks or setlines was reported in Tazlina and Mentasta to harvest whitefish and burbot. Fish spears were reported used by respondents from Chistochina, Copper Center/Silver Springs, Gakona, Glennallen, McCarthy/McCarthy Road, Mentasta, Slana and Tazlina/Copperville to catch whitefish, pike, lake trout and sucker.

Harvest Locations

Table 14 lists all the locations where respondents said they harvested non-salmon species during the study year. Place names are listed in alphabetical order. Along with the name is information on the general location of each place, whether the body of water is stocked by ADF&G, and the type of transportation used. As shown on the map (Figure 8) many harvest sites are located on the road system, and the major lakes of the Basin. Only a few are located on federal land, including Tanada Lake, Nelson Lake, Silver Lake, and Strelna Lake. Sites located on Copper River are fish wheels that reported a harvest of non-salmon species. Fishermen traveling on snow machines in winter most frequently fish lakes off the road system.

Harvest Effort

Table 15 summarizes the percentage of households in each community that attempted to harvest, harvested, used, received or gave away non-salmon species of fish. The percentage of households reporting a harvest of non-salmon species varied from a high of 88 percent in Slana to a low of around 33 percent in Mendeltna. Lake Louise reported the highest percentages in all categories with 90 percent of households reporting using non-salmon fish, 72 percent reporting receiving fish and 36 percent reporting giving away fish. Comparing 2001 data with that collected in 1987 shows declines in the percentage of households harvesting and using non-salmon species (Table16, note that data from 2001 and 1987 are not comparable for some communities). For example, in Chitina the percentage of households reporting a harvest of non-salmon species declined from 61 percent in 1987 to 37 percent in 2001, while in Kenny Lake the

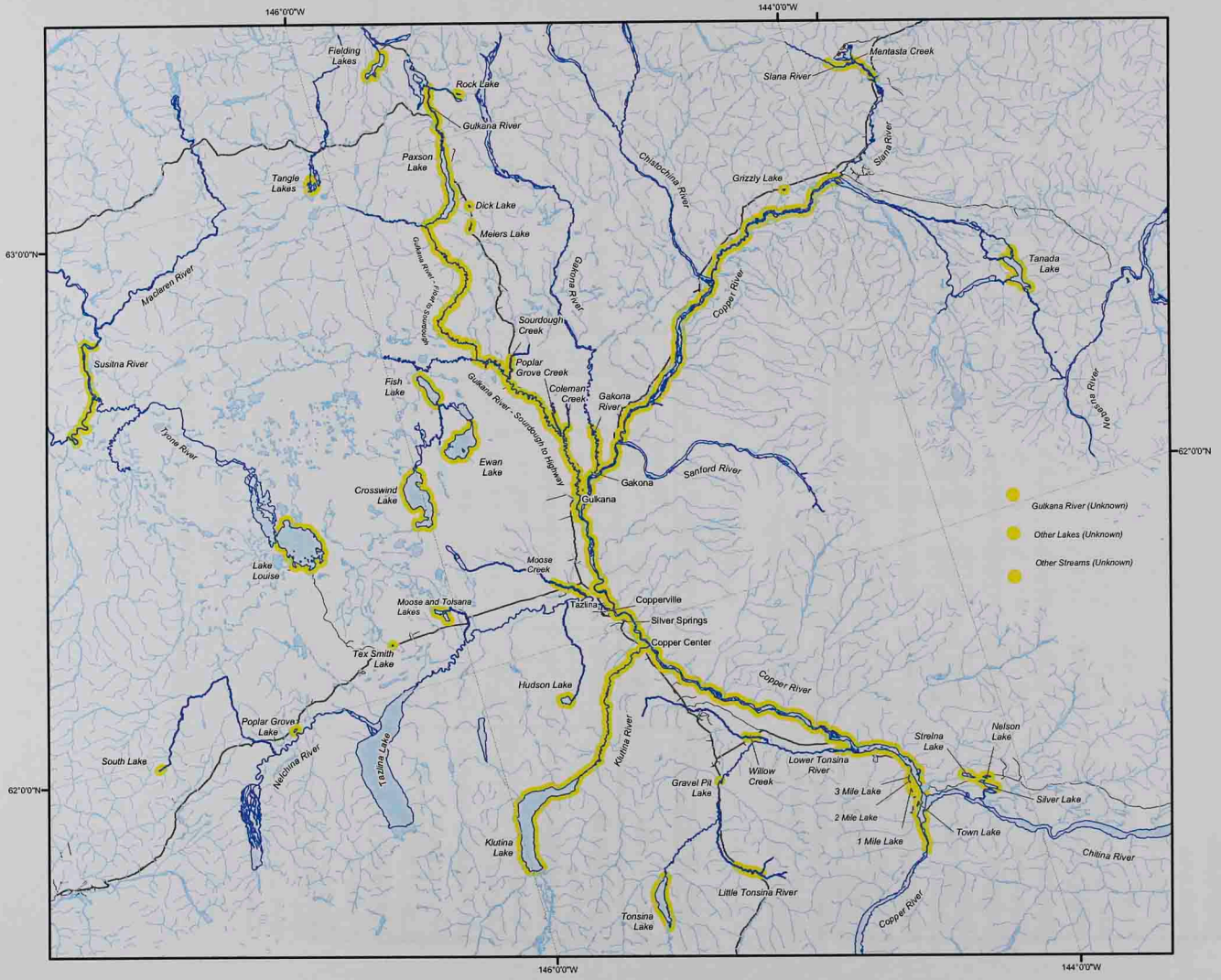


Figure Eight, Upper Copper River

Non-salmon Subsistence Catch Locations,
Map by LGL Alaska Research Associates

All Locations

Main Road

Secondary Road

0 4.5 9 18 27 36

Kilometers

1:850,000

N

percentage declined from 83 percent to 59 percent. In Lake Louise 100 percent of households reported a harvest in 1987 compared to 81 percent in 2001. In Mentasta the percentage of households reporting a harvest went up. Table 17 shows individual participation in non-salmon fishing. Slana, Mentasta, and Chitina reported the highest rates of individual participation in both fishing and processing non-salmon species.

Summary and Discussion

The survey documented the continued use of non-salmon fish by residents of the Copper Basin. Species taken in greatest quantities, in terms of pounds harvested, were whitefish, rainbow trout, grayling, burbot, Dolly Varden, and lake trout. Communities reporting the largest harvest of non-salmon species, over 1,000 pounds, were Copper Center/Silver Springs, Slana, Gakona, Tazlina/Copperville, Glennallen, Lake Louise, and Kenny Lake. Between communities the per-capita harvests ranged from 2.7 to 19.4 pounds. A majority of respondents reported catching non-salmon fish with rod and reel or ice fishing. Most harvests took place on state land in lakes and streams located on or near the highway system. Popular fishing spots located on federal land were situated in Wrangell St. Elias National Park and Preserve.

Before 1950 resident fish species played a greater role in the Basin economy than today. Fred Ewan estimated that before 1950 half the total harvest of fish for his extended family was made up of sockeye salmon while the other half was composed primarily of humpback whitefish and grayling. In addition his family harvested long nose suckers, primarily for dog food, some burbot, harvested mainly for their liver, and a few lake trout. The principal harvest of whitefish and grayling took place during the spring and fall migrations in lake outlets or streams where the Ahtna could deploy fish weirs, dip nets and fish traps. Most harvests of lake trout and burbot took place in the winter on lakes where the Ahtna could jig for them through the ice.

Fred thought an annual total harvest for whitefish and grayling was between 2,000 and 4,000 fish. He also said his family would harvest between 1,000 and 2,000 longnose suckers and a

lesser number of rainbow trout and burbot. Fred estimated that only about 25 to 30 lake trout were harvested because they were difficult to catch. Frank Stickwan said that when the grayling were running in the fall his family might harvest about 200 fish, but the fall harvest of grayling was influenced by the amount of meat people had. The more meat they had, the fewer grayling they harvested. Katie John said that her family annually harvested about 3,200 sockeye and about 100 whitefish, though she later said that her family filled three or four 100 pound gunnysacks full of dried whitefish. They also harvested about 1,000 suckers that were used to feed the dogs. Note that today, very few people have dog teams and the harvest of suckers is negligible. Reckord (1983a: 33-34) recorded one Ahtna elder who estimated that the annual harvest of whitefish and other non-salmon fish at Tyone Lake resulted in a cube of fish 8 feet on each side, and it provided much of the food for the Tyone Lake village.

Averaging Fred Ewan's harvest estimates of whitefish and grayling amounts to an annual harvest of 1,500 fish for each species. Multiplying 1,500 by a conversion factor of 0.7 for grayling and 0.9 for whitefish, we arrive at 1,050 pounds of grayling and 1,350 pounds of whitefish, or 2,400 pounds for an extended family of approximately 10 people. This does not take into account the harvest of burbot, sucker, or trout. Surveys conducted by the Division of Subsistence in the 1980s indicated that Copper Basin families continued to harvest non-salmon fish species but at much lower levels than those reported by Fred Ewan. For example, in eight Basin communities (Chistochina, Copper Center, Gakona, Glennallen, Gulkana, Kenny Lake, Lake Louise, and Mentasta) the average household harvest for all non-salmon species was 58 pounds in 1982 and 52 pounds in 1987 (ADF&G Community Profile Data Base). In 2001 the average household harvest for those same eight communities was 22 pounds.

Changes in settlement patterns and subsequent developments in regulation have contributed to the decline in the harvest of non-salmon fish in the Basin. In the 1950s, truancy laws and the decline in fur prices, which stimulated the desire for employment, forced many Ahtna families to settle permanently in communities along the highway system and abandon the traditional seasonal round (Reckord 1983a: 54). As a result, by the mid 1950s few families made the annual trip to fish for whitefish and grayling at places like Crosswind Lake, Ewan Lake, Lake Louise, or

open year around. After 1977 conservation concerns caused the state to tighten sport fishing regulations. Under current sport fishing regulations (2002-2003) unattended setlines for burbot are prohibited anywhere in the Basin except the main stem of the Copper River. Most burbot are harvested in the winter using setlines and in the past these could be left unattended during the night and checked in the morning. Now they must be attended. Because of conservation concerns both Tolosna Lake and Lake Louise, which are accessible by road, have been closed to all burbot fishing. Conservation concerns have also led to smaller bag limits for the harvest of lake trout, which are 1 or 2 fish depending on location.

Sport fishing regulations for the harvest of grayling and rainbow trout have also become more restrictive since 1977 in lakes that are not stocked by ADF&G. One reason for the restrictions on the harvest of wild rainbow trout is that the Copper River Basin is the edge of their natural range. In general regulation the daily limit is 2 fish per day, and only one of those may be over 20 inches long. For grayling the daily limit is five fish per day, but in lakes stocked by ADF&G the daily limit of rainbow trout and grayling is 10 per day for each species. There are no size limits on grayling, but only one rainbow 20 inches or longer may be kept. In state sport fishing regulations there is no restriction on the harvest of whitefish. They may be harvested using a spear and there is a fall spear fishery in the Slana River. Under current federal regulations any finfish, except for salmon and steelhead/rainbow trout, may be harvested without a permit.

As noted above, mean household harvests of non-salmon fish species for eight Basin communities declined from 58 pounds in 1982 to 22 pounds in 2001. Comparison of mean household harvests for five species of non-salmon fish in these same communities is illustrated in Table 18. It shows that average household harvests have fluctuated but generally trend downward.

The composition of the non-salmon harvest has changed since the 1950s. Before 1960 Ahtna harvests were composed primarily of whitefish and grayling, with suckers harvested primarily as dog food. Lake trout and burbot were of secondary importance. Current survey results show that whitefish were the predominant species harvested, followed closely by rainbow trout, grayling, and burbot. Rainbow trout and grayling are stocked by ADF&G in lakes easily

accessible by road, which explains the high harvest of these fish. Whitefish are considered subsistence fish used both for human consumption and dog food, but burbot is more popular among non-Natives because of their flavor, which is said to taste something like lobster (compare this Fred Ewan's statement that burbot meat was not eaten by humans but fed to the dogs). The popularity of burbot and lake trout in lakes located near the road system has caused populations of these fish to be over harvested and it is doubtful if the burbot population in Lake Louise can rebound (Tom Taube, personal communication).

In summary, the character of the non-salmon fishery in the Copper Basin has changed since the Ahtna were the principal users of the resource. Before 1960 the primary species harvested for human consumption were whitefish and grayling caught during the spring and fall with dip nets and basket traps placed in streams or lake outlets. Suckers were primarily harvested to feed dog teams. After 1960 a new fishing pattern emerged based on the use of rod and reel and setlines to catch trout, burbot, and grayling in lakes and streams situated close to the road system. Survey results show that this pattern continues. Whitefish are still harvested for human consumption, but more often for dog feed, and by only a small segment of the local population. More popular are rainbow trout and grayling caught in lakes stocked by ADF&G, and burbot and lake trout harvested during the winter in lakes that could be reached by snow machine.

Chapter Seven
Summary and Discussion

Historically the harvest of whitefish, trout, grayling, and burbot was crucial to the subsistence economy of the Copper Basin. The seasonal round as described by Ahtna elders included fishing for grayling and whitefish in the spring and fall in lake outlets or small streams where they could deploy dip nets and fish traps. Burbot and lake trout were caught primarily during the winter by jigging through the ice. One Ahtna elder said that his family harvested up to 2,400 pounds of whitefish and grayling in one year. The construction of highways in the mid 1940s,[1] which substantially increased the availability of wage employment, along with a decrease in the price of fur that made it uneconomical to trap, and pressure to keep children in school, brought changes in the traditional seasonal round as the Ahtna settled permanently in villages close to the highway system. By the 1970s few Ahtna families went to traditional fishing sites located at places like Crosswind or Tyone lakes and the harvest of non- salmon species among the Ahtna began to decline.

As the Ahtna settled into permanent communities along the road system the state's non-Native population grew placing increasing demand on the resources of the Basin. By the mid-1970s readily accessible stocks of fish in lakes along the highways soon reached their harvest capacities. Currently under state regulation any Alaska resident can harvest non-salmon fish in the Copper Basin under a subsistence permit issued by the area biologist, who sets restrictions on bag limits, or gear type. However few people apply for subsistence permits but instead fish under sport fishing regulations. Since the mid 1970s conservation concerns for burbot and lake trout in lakes close to the road system have forced the state to severely tighten regulations for these species. Sport fishing regulations for the harvest of grayling and rainbow trout have also become more restrictive in lakes not stocked by ADF&G. In state sport fishing regulations there is no restriction on the harvest of whitefish. They may be harvested using a spear and there is a

[1] Wolfe and Walker (1987:66) show that two of the factors that influence subsistence productivity are roads and settlement entry by non-Natives. They write that as the percentage of the non-Native population increases in an area overall subsistence productivity decreases.

> responsible for. Having a system that collects all available data into a single source would be a great benefit.
>
> At some point, the TEK and scientific data needs to be placed into an easily accessible site. It is interesting to see the TEK and scientific data mesh together (distribution data, run timing) but by looking at all the available information, a better understanding of the users and resource can be achieved (Tom Taube, personal communication).

There are two ways that traditional knowledge can contribute to environmental research and resource management: 1) traditional knowledge can extend our knowledge of the history of specific ecosystems; and 2) traditional knowledge can add to the general knowledge of local ecosystem dynamics by providing observations that are generally more detailed and wide ranging than those obtained by managers

According to Reist (1997:6) biological data on subarctic fishers is "poor" or "non-existent." Information on non-salmon fisheries in the Copper Basin goes back about 30 or 40 years and is confined to major lakes and streams. Managers have short chronologies on which to build predictions or management plans. In the third chapter of this report we presented information from about 1870 to 1950 that provides information on the presence or absence of species, as well as their distribution, migration patterns, and productivity. The oral traditions presented in chapter five extend this chronology even further back in time. One striking example of this is Katie John's reference to least cisco in Mentasta Lake. Katie noted that these small fish, which she called ***xaal ggaay,*** were found in Mentasta Lake into the early 20th century, but fisheries biologists have never documented their presence in the Copper River Basin. This kind of information will help managers to create a baseline for monitoring purposes and assist in planning and implementing future research projects.

Up until the 1950s Ahtna elders spent considerable time on the land. To make a living they traveled on foot and by dog team over large territories, returning to places year after year. As a result their observations of the environment are frequently more comprehensive, and in some instances more detailed, than those collected by managers. Collectively Ahtna elders have a

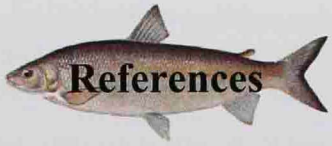
Crosswind Lake, and Frank thinks their movements in the fall are triggered by snow on the water. Other Crosswind Lake whitefish migrate to Second Hill Lake and return to Crosswind Lake in October.

Note that Crosswind Lake is 100 feet deep and is deeper than neighboring lakes such as Ewan Lake (21 feet), Fish Lake (18 feet), and Dog Lake (10 feet). The varying depths of these lakes (with different temperatures) may explain the constant movement of whitefish in and out of Crosswind Lake. This also might explain Fred Ewan's statement that humpback whitefish live in lakes within a 20-mile radius around Fish Lake and spawn in the lakes during the fall. In other words, Fred is noting the migration pattern of whitefish in the system of lakes that include Crosswind Lake, Dog Lake, Deep Lake, Fish Lake, Middle Lake and Ewan Lake.

Katie John described the seasonal movement of whitefish in the Slana River drainage. According to Katie when a lake has an outlet stream that goes into a river, whitefish move into the river during the summer. However if there is no river, whitefish follow creeks leading into lakes. Whitefish follow streams and might spawn in the stream if a river is unavailable. In the Slana River drainage, Katie said that whitefish leave Mentasta Lake in May and go down Mentasta Creek into the Slana River. They continue to migrate until the middle of June, spending the summer in small lakes and side streams. Then in October they move out of the lakes and head to the upper Slana River where they spawn. Whitefish begin to spawn in November, when the ice starts to form.

Besides adding to the scientific base line of specific ecosystems there are several general advantages to involving local people more closely in management: 1) it is generally more cost effective because enforcement is less of an issue; 2) it broadens the knowledge base (through the use of traditional knowledge) on which decisions are made and thus improving management; 3) develops better communication with users; 4) creates opportunities for participatory research, which improves management research and the information on which decisions are made. Participatory research also improves harvesters' attitudes towards the decision making process; 5) the nature and complexity of ecosystems demand more attention to detail than can be mustered by a centralized management system (McCay and Jentoft 1996:247). Because both

chronology of a fishery and a fuller understanding of ecological relationships. One example of this kind of collaborative research is the Back to the Future Program (BTF) of the University of British Columbia fisheries program. The BTF program seeks to evaluate present and past ecosystems by combining biological data with traditional knowledge, explorers' accounts, old maps, charts and photographs, historical catch data, and archaeological and anthropological information to build a quantitative ecosystem model using a computer program called Ecopath (Pitcher 1998:5). Such collaborative research has been proposed in project (FIS 04-553) submitted by the Division of Subsistence.



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APPENDIX A
SURVEY INSTURMENT

COPPER RIVER BASIN SALMON AND NON-SALMON SUBSISTENCE FISHING SURVEY, 2001

Alaska Department of Fish and Game, Division of Subsistence, CRNA, CheeshNa Tribal Council, Chitina Tribal Council and Mentasta Tribal Council

NON-COMMERCIAL FISHING: NON-SALMON FINFISH.

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE FISH OTHER THAN SALMON BETWEEN OCTOBER 1 2000 AND SEPTEMBER 30 2001? YES: ____ NO: ____

IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (UNITS SHOULD INDICATE INDIVIDUALS UNLESS NOTED OTHERWISE. POUNDS SHOULD BE EDIBLE WEIGHT):

SPECIES	USED? Y/N	TRIED TO HARVEST Y/N	ROD & REEL #	DIP NET #	Gill NET #	ICE FISHING #	FISH WHEEL #	OTHER* GEAR #	SET LINE #	UNITS	RECVED Y/N	GAVE AWAY Y/N	LOCATION* OF HARVEST 1	LOCATION* OF HARVEST 2	METHOD* OF TRAVEL	NUMBER OF DAYS FISHING
DOLLY VARDEN										IND						
125006002										1						
LAKE TROUT										IND						
125010002										1						
RAINBOW TROUT										IND						
126204002										1						
TROUT, UNKNOWN										IND						
126299002										1						
GRAYLING										IND						
125200002										1						
PIKE										IND						
125499002										1						
WHITEFISH										IND						
126499002										1						
BURBOT										IND						
124800002										1						
STEELHEAD										IND						
126206000										1						
SUCKER										IND						
126000000										1						
										IND						
										1						

*Other Gear Type, write name of other gear type here _____

*Location of harvest, use numbers on list of water bodies provided

*Method of travel, write in primary type of transportation used, i.e. foot, automobile, ATV, snowmachine, dog team, horse, boat, etc.

APPENDIX B
Estimated Harvest and Use of Non-Salmon Resources by Community, Copper River Non-Salmon Fish Survey, 2001

Estimated Harvest and Use of Nonsalmon Resources, Chistochina, 2001

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest
Non-Salmon Fish	66.7	56.7	56.7	20	13.3	533.91	14.43	6.76	409.47	11.07	0.251
Burbot	10	10	10	0	0	168.72	4.56	2.14	70.3	1.9	0.541
Char	26.7	23.3	23.3	3.3	3.3	169.95	4.59	2.15	86.33	2.33	0.347
Arctic Char	0	0	0	0	0	0	0	0			0
Dolly Varden	6.7	3.3	3.3	3.3	0	2.22	0.06	0.03	2.47	0.07	0.89
Lake Trout	20	20	20	0	3.3	167.73	4.53	2.12	83.87	2.27	0.358
Grayling	43.3	43.3	43.3	10	10	129.5	3.5	1.64	185	5	0.277
Pike	3.3	3.3	3.3	0	0	6.91	0.19	0.09	2.47	0.07	0.89
Sucker	0	0	0	0	0	0	0	0	0	0	0
Trout	0	0	0	0	0	0	0	0	0		0
Rainbow Trout	0	0	0	0	0	0	0	0	0	0	0
Steelhead	0	0	0	0	0	0	0	0	0	0	0
Unknown Trout	0	0	0	0	0	0	0	0	0	0	0
Whitefish	20	13.3	13.3	10	3.3	58.83	1.59	0.75	65.37	1.77	0.559

Estimated Harvest and Use of Nonsalmon Resources, Gakona, 2001

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest
Non-Salmon Fish	58.13	71.53	58.13	8.13	16.27	2039.15	24.28	8.12	2022	24.07	0.97
Burbot	20.34	20.34	20.34	4.07	0	319.8	3.81	1.27	133.25	1.59	0.95
Char	28.47	36.61	28.47	4.07	4.07	255.91	3.05	1.02	205	2.44	0.66
Arctic Char	0	0	0	0	0	0	0	0			0
Dolly Varden	16.27	20.34	16.27	4.07	4.07	126.08	1.5	0.5	140.08	1.67	0.88
Lake Trout	16.27	24.4	12.2	4.07	0	129.83	1.55	0.52	64.92	0.77	1.14
Grayling	48.81	58.13	48.81	4.07	12.2	349.18	4.16	1.39	498.83	5.94	0.5
Pike	0	0	0	0	0	0	0	0			0
Sucker	0	0	0	0	0	0	0	0			0
Trout	16.27	16.27	16.27	0	0	133.93	1.59	0.53	95.67	1.14	0.86
Rainbow Trout	16.27	16.27	16.27	0	0	133.93	1.59	0.53	95.67	1.14	0.86
Steelhead	0	0	0	0	0	0	0	0			0
Unknown Trout	0	0	0	0	0	0	0	0			0
Whitefish	9.33	9.33	9.33	0	4.07	980.33	11.67	3.91	1089.25	12.97	1.63

Estimated Harvest and Use of Nonsalmon Resources, Gulkana, 2001

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest
Non-Salmon Fish	54.5	54.5	45.5	27.3	9.1	431.4	13.07	6.85	450	13.64	0.879
Burbot	18.2	9.1	9.1	0	0	108	3.27	1.71	45	1.36	1.819
Char	0	0	0	0	0	0	0	0	0	0	0
Arctic Char	0	0	0	0	0	0	0	0	0	0	0
Dolly Varden	0	0	0	0	0	0	0	0	0	0	0
Lake Trout	0	0	0	0	0	0	0	0	0	0	0
Grayling	45.5	36.4	36.4	27.3	0	252	7.64	4	360	10.91	0.832
Pike	0	0	0	0	0	0	0	0	0	0	0
Sucker	0	0	0	0	0	0	0	0	0	0	0
Trout	27.3	27.3	27.3	0	9.1	71.4	2.16	1.13	45	1.36	1.25
Rainbow Trout	18.2	18.2	18.2	0	0	58.8	1.78	0.93	42	1.27	1.35
Steelhead	9.1	9.1	9.1	0	9.1	12.6	0.38	0.2	3	0.09	1.819
Unknown Trout	0	0	0	0	0	0	0	0	0	0	0
Whitefish	0	9.1	0	0	0	0	0	0	0	0	0

Estimated Harvest and Use of Nonsalmon Resources, Lake Louise, 2001

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest
Non-Salmon Fish	90.9	90.9	81.8	72.7	36.4	1637.59	8.03	2.86	1493.81	7.32	0.359
Burbot	63.6	63.6	54.5	36.4	18.2	189.52	0.93	0.33	78.97	0.39	0.645
Char	63.6	72.7	54.5	27.3	0	476.77	2.34	0.83	421.16	2.06	0.805
Arctic Char	0	0	0	0	0	0	0	0			0
Dolly Varden	0	0	0	0	0	299.09	1.47	0.52	332.32	1.63	0.987
Lake Trout	63.6	72.7	54.5	27.3	0	177.68	0.87	0.31	88.84	0.44	0.627
Grayling	27.3	45.5	27.3	0	0	340.88	1.67	0.6	486.97	2.39	0.474
Pike	9.1	9.1	9.1	0	0	0	0	0	0	0	0
Sucker	0	0	0	0	0	0	0	0	0	0	0
Trout	18.2	18.2	18.2	0	0	488.28	2.39	0.85	348.77	1.71	0.546
Rainbow Trout	18.2	18.2	18.2	0	0	488.28	2.39	0.85	348.77	1.71	0.546
Steelhead	0	0	0	0	0	0	0	0	0	0	0
Unknown Trout	0	0	0	0	0	0	0	0	0	0	0
Whitefish	72.7	63.6	54.5	36.4	27.3	142.14	0.7	0.25	157.94	0.77	1.16

Estimated Harvest and Use of Nonsalmon Resources, Mentasta, 2001

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest
Non-Salmon Fish	75	68.8	68.8	40.6	28.1	967.44	17.92	6.59	1167.75	21.63	0.37
Burbot	3.1	3.1	3.1	0	0	4.05	0.07	0.03	1.69	0.03	1.302
Char	9.4	9.4	9.4	0	3.1	24.13	0.45	0.16	18.56	0.34	0.844
Arctic Char	0	0	0	0	0	0	0	0	0	0	0
Dolly Varden	6.3	6.3	6.3	0	0	10.63	0.2	0.07	11.81	0.22	0.915
Lake Trout	6.3	6.3	6.3	0	3.1	13.5	0.25	0.09	6.75	0.13	1.019
Grayling	46.9	43.8	43.8	21.9	15.6	327.21	6.06	2.23	467.44	8.66	0.526
Pike	0	0	0	0	0	0	0	0	0	0	0
Sucker	0	0	0	0	0	0	0	0	0	0	0
Trout	0	0	0	0	0	0	0	0	0	0	0
Rainbow Trout	0	0	0	0	0	0	0	0	0	0	0
Steelhead	0	0	0	0	0	0	0	0	0	0	0
Unknown Trout	0	0	0	0	0	0	0	0	0	0	0
Whitefish	62.5	56.3	53.1	40.6	18.8	612.06	11.33	4.17	680.06	12.59	0.438

Estimated Harvest and Use of Nonsalmon Resources, Nelchina, 2001

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest
Non-Salmon Fish	66.7	61.1	61.1	16.7	0	525.75	19.47	6.15	442.5	16.39	0.414
Burbot	0	11.1	0	0	0	0	0	0	0	0	0
Char	27.8	27.8	27.8	5.6	0	145.65	5.39	1.7	88.5	3.28	0.609
Arctic Char	0	0	0	0	0	0	0	0			0
Dolly Varden	16.7	16.7	16.7	0	0	25.65	0.95	0.3	28.5	1.06	0.676
Lake Trout	16.7	16.7	16.7	5.6	0	120	4.44	1.4	60	2.22	0.742
Grayling	44.4	38.9	38.9	5.6	0	115.5	4.28	1.35	165	6.11	0.579
Pike	0	0	0	0	0	0	0	0	0	0	0
Sucker	0	0	0	0	0	0	0	0	0	0	0
Trout	50	50	50	5.6	0	264.6	9.8	3.09	189	7	0.374
Rainbow Trout	50	50	50	5.6	0	264.6	9.8	3.09	189	7	0.374
Steelhead	0	0	0	0	0	0	0	0	0	0	0
Unknown Trout	0	0	0	0	0	0	0	0	0	0	0
Whitefish	0	0	0	0	0	0	0	0	0	0	0

Estimated Harvest and Use of Nonsalmon Resources, Slana, 2001

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest
Non-Salmon Fish	88	88	88	36	24	2198.52	35.46	18.09	1929.44	31.12	0.333
Burbot	44	44	40	16	8	482.11	7.78	3.97	200.88	3.24	0.662
Char	56	56	56	20	4	616.78	9.95	5.08	448.88	7.24	0.583
Arctic Char	0	0	0	0	0	0	0	0	0	0	0
Dolly Varden	32	32	32	8	4	229.9	3.71	1.89	255.44	4.12	0.637
Lake Trout	44	44	44	16	0	386.88	6.24	3.18	193.44	3.12	0.584
Grayling	84	80	76	12	20	661.42	10.67	5.44	944.88	15.24	0.333
Pike	12	12	12	4	4	194.43	3.14	1.6	69.44	1.12	0.916
Sucker	4	4	4	0	0	17.36	0.28	0.14	24.8	0.4	1.594
Trout	8	8	8	0	4	23.31	0.38	0.19	14.88	0.24	1.344
Rainbow Trout	4	4	4	0	4	3.47	0.06	0.03	2.48	0.04	1.594
Steelhead	0	0	0	0	0	0	0	0	0	0	0
Unknown Trout	4	4	4	0	0	19.84	0.32	0.16	12.4	0.2	1.594
Whitefish	32	32	32	8	8	203.11	3.28	1.67	225.68	3.64	0.632

Estimated Harvest and Use of Nonsalmon Resources, Tolsona, 2001

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest
Non-Salmon Fish	60	60	53.3	26.7	6.7	84.2	5.61	2.72	64	4.27	
Burbot	20	20	6.7	13.3	0	9.6	0.64	0.31	4	0.27	
Char	13.3	26.7	6.7	13.3	0	6	0.4	0.19	3	0.2	
Arctic Char	0	0	0	0	0	0	0	0	0	0	
Dolly Varden	0	0	0	0	0	0	0	0	0	0	
Lake Trout	13.3	26.7	6.7	13.3	0	6	0.4	0.19	3	0.2	
Grayling	20	26.7	20	6.7	0	11.2	0.75	0.36	16	1.07	
Pike	0	0	0	0	0	0	0	0	0	0	
Sucker	0	0	0	0	0	0	0	0	0	0	
Trout	26.7	40	26.7	6.7	6.7	57.4	3.83	1.85	41	2.73	
Rainbow Trout	26.7	40	26.7	6.7	6.7	57.4	3.83	1.85	41	2.73	
Steelhead	0	0	0	0	0	0	0	0	0	0	
Unknown Trout	0	0	0	0	0	0	0	0	0	0	
Whitefish	0	0	0	0	0	0	0	0	0	0	

Estimated Harvest and Use of Nonsalmon Resources, Willow Creek, 2001

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest
Non-Salmon Fish	37.5	37.5	37.5	4.2	8.3	472	5.9	2.83	440	5.5	0.611
Burbot	8.3	8.3	8.3	0	0	32	0.4	0.19	13.33	0.17	1.197
Char	33.3	33.3	33.3	4.2	0	111	1.39	0.67	123.33	1.54	0.612
Arctic Char	0	0	0	0	0	0	0	0	0	0	0
Dolly Varden	33.3	33.3	33.3	0	0	111	1.39	0.67	123.33	1.54	0.612
Lake Trout	4.2	4.2	0	4.2	0	0	0	0	0	0	0
Grayling	25	25	25	0	4.2	95.67	1.2	0.57	136.67	1.71	0.895
Pike	0	0	0	0	0	0	0	0	0	0	0
Sucker	0	0	0	0	0	0	0	0	0	0	0
Trout	37.5	37.5	37.5	0	4.2	233.33	2.92	1.4	166.67	2.08	0.548
Rainbow Trout	37.5	37.5	37.5	0	4.2	233.33	2.92	1.4	166.67	2.08	0.548
Steelhead	0	0	0	0	0	0	0	0	0	0	0
Unknown Trout	0	0	0	0	0	0	0	0	0	0	0
Whitefish	0	0	0	0	0	0	0	0	0	0	0